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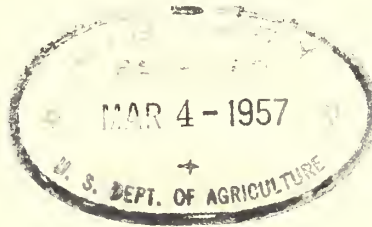
*Luke M. Schenken*

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PRELIMINARY REPORT

ON

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WISCONSIN POST-WAR PROBLEMS AND PROGRAMS



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Prepared at Request of -

Midwest Committee On

Post-War Programs

For Agriculture //

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MILWAUKEE, WISCONSIN

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FEBRUARY - 1944

## FOREWARD

Responsibility for the preparation of this preliminary report was taken by staff members of the U. S. Department of Agriculture under an informal working arrangement with the University of Wisconsin, College of Agriculture.

The University of Wisconsin, College of Agriculture provided technical assistance, council, much of the information, and many of the ideas included in the report. The State Department of Conservation and members of rural electrification cooperatives participated as shown in each section.

The U. S. Department of Agriculture takes full responsibility for the content of the report with acknowledgement of assistance as shown in each section of the report.



## I. DYNAMICS AND POTENTIALITIES OF THE SITUATION AT THE END OF THE WAR

It is not necessary to try to predict when the war will end in order to foresee some situations that will be of major concern to the Agriculture of Wisconsin during the period of demobilization and beyond. Each of the sections of this report deals more specifically with some of the categories of problems likely to confront us regardless of when the war ends.

The "War-Boom" in Agriculture - One of the most important facts that should be recognized in anticipating problems that may begin to appear in the demobilization period is that very favorable agricultural prices and incomes and broad demands for a high volume of agricultural products, are "war-boom" situations. Except for a few years during the demobilization and adjustment period at home and abroad, these wartime prices and demands should not be expected to continue without some decline.

To be prepared psychologically and to be prepared from a business point of view to adjust to changing demands and less favorable farm incomes is a post-war planning responsibility of individual farmers. Since everyone reacts to information, and educational efforts in terms of his experience, all public agencies have a responsibility for providing reliable and accurate information in understandable form to help individual farmers meet varying situations.

The Conversion Job in Agriculture - In contrast with the enormous task of reconversion and retooling facing industry as it changes from war production to peace production, agriculture faces a much more simple job. Wisconsin agricultural war production will also be its peace production with only minor crop and livestock adjustments. (See Section II.)

The most important and difficult problems confronting agriculture are those which agriculture shares with society as a whole rather than the production and management problems a farmer faces within the line fences of his own farm. This fact does not minimize the importance of individual farmer efficiency, but does emphasize the fact that this in itself is not enough to assure a prosperous agriculture. Farmers can manage the problems of supply if the demand side of the equation stays up. Realistically this calls for keeping factories open instead of shutting farms down. It calls for income from jobs in the hands of all who can work. It calls for constructive international trade policies. It calls for state and national taxation and fiscal policies that will encourage expanding production and prevent violent fluctuations. How well these problems are handled will determine prosperity for agriculture. Farmers can contribute most effectively to the formulation of sound policies in these fields by thinking of themselves as a part of the national economy rather than as a special group trying to obtain special consideration.

Rising Prices Would Wipe Out Effects of Savings - The immediate demobilization period, is likely to see a still more rapid rise in prices and a continuing demand for agricultural products. It will be equally as important to continue rationing and price controls until production begins to catch up with demand if it is to prevent inflation during the war period. Uncontrolled runaway prices could easily dissipate the savings of farmers and others before this stored-up purchasing power makes itself effective in reestablishing employment in peacetime production. Unless the basis for high industrial employment is laid during the demobilization period, agriculture will have a dark outlook for finding an outlet for the high farm production that can easily be maintained.

Agriculture's Stake in Full Employment - The early stages of demobilization of armed forces and cancellation of contracts for war materials is likely to result in acute temporary unemployment situations in communities where war jobs have resulted in large population concentrations. The employment base in some communities will be permanently reduced by cancellation of war contracts. The application of the principle of relief work that might retard population readjustment in such communities is obviously open to serious question. When complete demobilization gets under way, the enormous task of reconversion of plants might result in large numbers of temporarily unemployed, giving rise to much demand for relief work on a wide scale. If this situation develops it will call for the greatest of caution not to institute public relief work at the wrong place and at the wrong time.

The demobilization period is likely to find Wisconsin agriculture still continuing at peak production. Labor, machinery and fertilizer supplies are likely to ease up considerably, but production continue high. Delays caused by retooling and conversion will not confront agriculture as they will industry. Agriculture for a temporary period may appear particularly inviting to many who are waiting for their factory to get under way. A voluntary back-to-the-land movement of considerable proportions might develop from this unusual circumstance. If at the same time rural public relief works were initiated because of urban unemployment situations we might experience the combined effect of a public sponsored as well as a voluntary landward movement of population. The resulting dislocations of people from possible permanent employment opportunities thus could be a direct result of poor timing of public works programs. Furthermore, if the public relief projects were located in the cut-over areas, families would be induced to move into an area where the employment base is already low and would contribute to a reversal of an adjustment in the right direction that has taken place during the war.

Obviously, the farmers principal market lies in employed people, therefore, agriculture should be on the side lines cheering the efforts of industry to reconvert from war production with an employment rate much higher than any pre-war period. In addition to a relatively high employment rate, agriculture is equally interested in high production rates as well. Adjustments in price relationships in wages, farm prices and industrial farm products are essential to serve peacetime needs. A basis for maladjustments in consumption and hence a basis for general depression will result if either wages or agricultural prices or prices of industrial products are not adjusted to continue "full" consumption as well as "full" production. Without question, the Federal Government has responsibility to help stabilize these price relationships through whatever controls are necessary during the demobilization and readjustment period.

Much effort needs to be expended by farmers to understand the complex relationships and interdependence of agriculture and business and labor, and the rightful place of government representing society as a whole.

Adjustment of Population To Resources - Population dislocations have been caused by war employment. Concentrations of workers in some cities will face relocation problems as war contracts are cancelled. Agriculture of Wisconsin has contributed manpower to the armed forces, and even more to non-farm work. The greatest movement of population has been from the cut-over areas. The cut-over area is still a frontier seeking to adjust

population to limited resources and should not be expected to reabsorb all the population that moved out for more productive work. (See Section V.)

The Agriculture of Wisconsin will reabsorb some of the manpower drained off to war and war work, and can be expected to make conscious and constructive efforts to do so. Industrial communities in the state, through committees for economic development are planning now to hold peacetime jobs at a high level. Agricultural communities and neighborhoods can do the same. It would be an admission of a breakdown in our economy, however, to plan and execute publicly sponsored movements of any considerable number of unemployed people back to the land. Individuals with farm backgrounds with the aid of intelligent guidance available in farm communities and through state educational programs will likely take up all the real opportunities for productive farm employment in the postwar period. (See Section V.)

During the war, agriculture has increased production enormously even with a decline in manpower. In 1943, agricultural production was about 32% above 1935-39, while manpower had declined. Even if postwar agricultural production is maintained at 1943 levels it is hardly conceivable that an increase of more than about a million more workers would be needed. Any substantial increase over this number would result in a decline in average productivity per worker in the agricultural labor force and therefore, would result in a less favorable exchange ratio with industrial production.

A solution to any widespread unemployment situation that may develop will not be found in a major movement of people to the land.





## II. DEVELOPMENT AND CONSERVATION OF PHYSICAL RESOURCES

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### Crop and Pasture Land Conservation and Development

This report is tentative. Some of the data used as bases for proposed accomplishments must of necessity be predicated on estimates because of lack of sufficient factual information. The estimates of desirable work to be done are based upon best information available, and the time element does not permit the preparation of a better and more comprehensive report.

Mr. M. F. Schweers, state conservationist of the Soil Conservation Service, who prepared this report, is indebted to Professor O. R. Zeasman, Dr. Emil Truog, Dr. Robert Muckenhirn, Dr. Larry Graber, Dr. Henry Ahlgren, and Professor P. E. McNall of the staff of the College of Agriculture who were most kind in providing counsel and guidance in the preparation of numerous sections of this report. Professor Zeasman, in particular, provided considerable assistance and personally developed several sections of the report. Because of lack of time, it has been impossible to secure approval of the contents of this report from College staff members. Several personnel of the Soil Conservation Service also devoted much time to it, and special credit must be given to Howard Ream of the regional office staff, who made the major contribution to its preparation.

Much can be said as to how the construction and editorial composition of this report could have been improved. However, each of the contributors had his ideas on how best the information for his particular assignment could be presented and, accordingly, it was written on the basis of the individual's personal judgment. Time did not permit a realignment of the discussions to follow a uniform pattern, or to perform a major editorial operation.

## INTRODUCTION

In preparing this report on "Crop and Pasture Land Conservation and Development", the outline appearing in the mimeographed release on "Proceedings - Midwest Committee on Post-War Programs - October 7 and 8, 1943", page 34, was used as a guide.

It was deemed advisable to develop this plan on the basis of soil resource areas. In collaboration with personnel of the College, the Soil Conservation Service prepared a "Conservation Needs Inventory" in which delineations were made of soil resource areas and data presented for each area on recommended changes in land-use practices necessary to maintain soil fertility, etc. It was decided to use this map and information contained therein as a basis for preparing certain sections of this report. In order to bring the number of areas to a practical minimum, several combinations were made. After this map had been prepared, it was checked by Dr. Muckenhirn who believed it to be a satisfactory division of soil resource areas.

The next determination concerned the composition of the report. In this connection, it was deemed advisable to prepare it in a fashion comparable to District "Programs" and "Work Plans" - that is, the "Program" portion of the report includes a brief description of the physical resources of the various areas with the long-time land use and development objectives for each; the "Work Plan" portion concerns itself with developments or jobs which should be accomplished during the two-year period immediately following the cessation of hostilities in the European theater of war. The proposed accomplishments are those which should be made during this period if our soils are to be maintained at a desirable standard of fertility. The goals are not to be construed as being within a program of normal expectancy. It is questionable whether the goals and accomplishments can be attained on the basis of present demands and farmers' attitudes to cost-result relationship. The contributors do not believe it is either their responsibility to determine how the jobs are to be done or who will do them, but they feel it is their responsibility to present what should be done. Labor, equipment, and material needs are therefore necessary details.

Soil Conservation District supervisors have given considerable thought to the problem of post-war planning, and have recommended that public assistance be held to an absolute minimum. They, as everyone else, hope that the transitional period from war-time to peace-time economy will see very little unemployment and that the changes in agricultural progress and development can be accomplished without any or with very little cost to the public. However, if in the event public works programs are in

the picture, Districts can and will be in a position to utilize the labor and facilities advantageously.

It is suggested that the administration of a post-war program be channeled through the medium of Soil Conservation Districts. By virtue of the State Soil Conservation Districts Law, District Supervisors have definite responsibilities to maintain and preserve the soil resources of their respective Districts, and are given a wide latitude of powers to accomplish these objectives. Furthermore, in the thirty-six counties of the state which are now Soil Conservation Districts, the Supervisors have had experience in the fields of soil conservation and administration, and present the type of leadership which could adequately handle programs of real magnitude. In recommendations made by District Supervisors, it has been indicated that any program having to do with land use and soil conservation should be administered, insofar as practical, through the medium of Soil Conservation Districts, and should be under the direction of the district governing bodies.

1. The first part of the paper  
discusses the general principles  
of the theory of the  
relativity of simultaneity.  
It is shown that the  
time interval between two  
events is not absolute, but  
depends on the relative  
velocity of the observer  
and the events.

2. The second part of the paper  
discusses the special theory  
of relativity. It is shown  
that the laws of physics are  
the same in all inertial  
frames of reference. The  
velocity of light is shown  
to be constant in all  
inertial frames of reference.  
The theory of relativity  
is shown to be in agreement  
with the experimental results  
of the Michelson-Morley  
experiment.

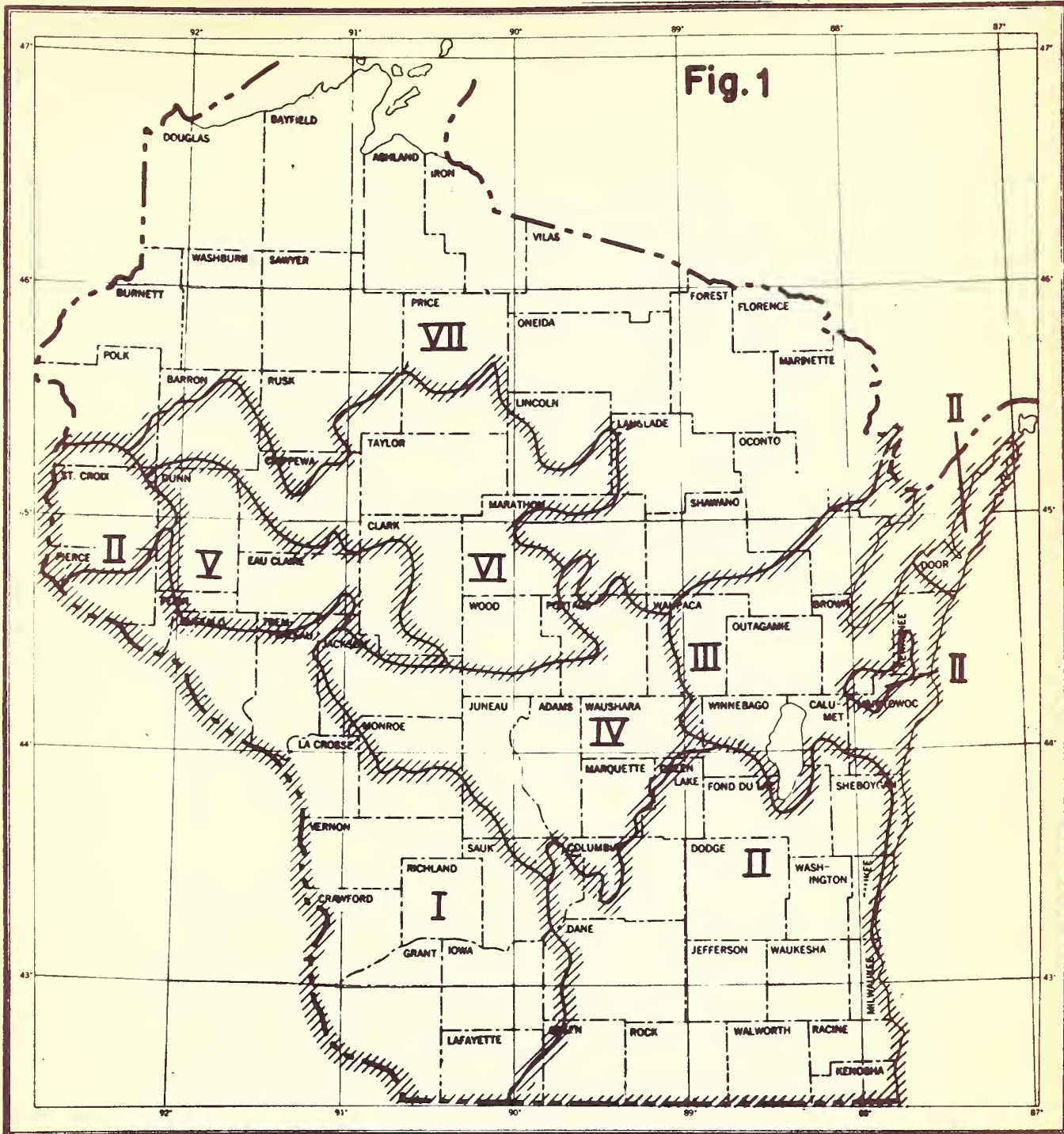


# GENERAL LAND RESOURCE AREA MAP

(PROVISIONAL)

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
R. H. BERRY, CHIEF

UPPER MISSISSIPPI VALLEY REGION  
WISCONSIN  
R. H. BERRY, SOIL CONSERVATION



Reference Generalized soil maps of  
state of Wisconsin

SCALE IN MILES  
0 25 50 75

- |                              |                             |
|------------------------------|-----------------------------|
| I. Southwestern Upland Area  | IV. Central Sand Area       |
| II. Glaciated Limestone Area | V. Rolling Sand Area        |
| III. Red Clay Area           | VI. Central Heavy Soil Area |
| VII. Cut Over Area           |                             |



## A - ANALYSIS OF RESOURCES

### Description of Areas <sup>1/</sup>

#### AREA I - Southwestern Upland Area - 4,793,516 Acres

The area is commonly known as the unglaciated section of Wisconsin. The soils of the area are primarily of windblown origin or are residual from limestone with a thin covering of windblown material. The Dubuque, Clinton and Fayette soil series predominate with areas of prairie and transitional soils of the Tama and Downs series scattered throughout the central and southern part of the area. Along the major streams, particularly in the Wisconsin River valley, sandy outwash soils of the Plainfield, LaCrosse and Sparta series predominate. These areas, while rather small in extent, are made up of soils of comparatively low productivity and present a problem of wind erosion control.

The topography of the area is generally undulating to steeply rolling. Immediately adjacent to the Mississippi and Wisconsin Rivers steep bluffs occur. Sheet erosion has been moderate to severe on the upland soils of the area. According to a survey made by the Wisconsin State Soil Conservation Committee, five inches or more of soil has been lost from over 60% of the cultivated upland of this area. Gully erosion is a serious problem. Large outlet gullies, cutting back from streams are dissecting many of the bordering terraces, and smaller gullies occur in many of the contributing watersheds.

Rainfall is usually well distributed throughout the growing season, but torrential rains often occur during the summer which accelerate the erosion problem.

#### AREA II - Glaciated Limestone Area - 5,783,564 Acres

This area is characterized by the presence of numerous oval hills of glacial drift, commonly called drumlins. These drumlins average about a quarter of a mile in width and are frequently several miles in length. They are interspersed in the general morainic topography of the area. This morainic topography consists of terminal and recessional moraines of various periods of glaciation, kettle moraines, interspersed with areas of outwash gravel and sandy terraces, alluvial and lacustrine deposits and marshes. The slopes of the drumlins are very uniform. Some of the recessional moraines are quite uniform, but the great majority of them form strong upland belts of rough wooded country. The kettle moraines are very irregular

<sup>1/</sup> Refer to Figure 1.

in topography, because of the deep hollows or pits enclosed by irregular ridges formed by melting buried blocks of ice during glaciation.

The soils of the upland are predominantly of the Miami and Bellefontaine series with depressional areas of the Clyde series. Soils of the Fox and Waukosha series are found on the terraces. Rodman gravel is formed on many of the steep, irregular slopes. Spotted throughout the central part are areas of prairie soil of the Parr (Carrington) series.

Estimates of erosion conditions in the area indicate that more than five inches of soil has been lost from about 40% of the scattered sections, particularly along the shores of Lake Michigan. A considerable acreage of wet land and marsh land not now in cultivation exists, much of which is suitable for drainage. Drainage on many of the Clyde soils now being farmed is poor.

This area contains a large proportion of the population of the state and earns a large percentage of the state farm income.

#### AREA III - Red Clay Area - 2,276,958 Acres

The topography of this area varies from nearly level or gently undulating to moderately rolling. Soils of the Superior and Poygan series are found immediately adjacent to Lake Winnebago and along the shores of Lake Michigan and Green Bay. The more rolling upland soils are generally of the Kewaunee series, soils of similar origin as the Superior series but which have been reworked by the glacier. Areas of Miami and Bellefontaine interspersed with the Clyde series are found along the western and northern part and within localized sections of the area.

The erosion problem is not severe over much of the area because of the large proportion of nearly level land. However, on the rolling Kewaunee soils, infiltration of water is low and erosion is in evidence. Likewise, erosion is a problem on the Miami and Bellefontaine soils. Large areas of Superior, Poygan and Clyde soils, mostly on occupied farms are too wet and poorly drained for cultivation and are in pasture or marsh or occupy swales or potholes in cultivated land. A considerable acreage of cropland is limited in productivity because of deficient drainage.

#### AREA IV - Central Sand Area - 1,991,508 Acres

A belt of rolling or of rough hummocky sandy or gravelly soils is found running in a north and south direction through eastern



Portage, Waushara and Marquette counties. This is a moraine and marks the border of the glaciated sandy section. The moraine is made up of soils of the Coloma and Scandia series. The glaciated sandy section lies east of the Moraine and comprises most of Marquette, the eastern parts of Waushara and Portage counties and the northwest corner of Columbia county. Coloma sands, fine sands and sandy loams predominate with smaller amounts of Coloma stony and gravelly sand and of Coloma loam. West of the moraine and occupying most of the central section of the area adjacent to the Wisconsin River is a level outwash sandy plain. This plain was formed by the temporary damming of the Wisconsin River valley by the ice of the glacier where it crossed the valley in the vicinity of Wisconsin Dells. Scattered over the area of the old lake are a number of hills of sandstone which were islands in the lake. The soils of the area are largely of the Plainfield series with scattered areas of peats and mucks. West of the Wisconsin River in sections too high to be covered by the waters of the lake the soils are largely residual from sandstone. The soils here are classified generally in the Hixton, Gale and Boone series.

Water erosion is a very serious problem on cultivated land in the glaciated sandy section, on the moraine, and in the residual sandstone sections. The difficulty in establishing good vegetative cover in meadows and pastures has accentuated the erosion problem. Wind erosion is serious over much of the outwash sandy plain section. Gullying is noticeable to some degree in the glaciated section due to the inability of farmers to establish grassed waterways. In the residual sandy section, extremely large outlet gullies have advanced back from the streams and have dissected and laid waste large watersheds.

The soils throughout the area are acid, drouthy and low in organic matter and fertility.

#### AREA V--Rolling Sand Area - 1,041,680 Acres

The topography of this area consists for the most part of moderately steep slopes running up to rather sharp ridges with in bluff-like faces. In some cases there is some level or undulating upland on these ridges. In some parts of Dunn County and in western Eau Claire county the topography is more gently undulating, and some quite level terraces are found.

Soils on this topography are derived from sandstone and are largely of the Boone series. Sheet erosion is a very serious problem and many large gullies are found throughout most of the area. In the eastern part of Eau Claire and in the portion of Clark County in Area V, is an area of level to slightly rolling

sandy soils, overlying shale rock. They are for the most part rather poorly drained and are classified in the Vesper or Klegghorn series. These soils are very acid and inherently low in fertility. Due to their low agricultural value, it is questionable if it is feasible to drain them.

#### AREA VI - Central Heavy Soil Area - 2,484,185 Acres

The area is characterized by soils developed from acid rocks. Most of the soils have a low permeability to water penetration because of the development of a compact silty clay loam layer in the subsoil. Slopes are generally long and uniform, and vary from level to gently rolling. The major soil types are Spencer, Almota, Auburndale, Granton, Loyal, Dither and Cable silt loams. A few scattered areas of soils devoid of the heavy subsoil layer occur. These soils are well drained and are classified in the Marathon, Fenwood and Rozellville series.

Erosion is fast becoming a problem on the areas having any appreciable slope. It is estimated that over 50% of the cultivated soils have lost from one to four inches of topsoil and about 30% have lost over five inches of soil. The chief problem in erosion control involves the removal as well as the disposal of large amounts of surface water.

The soils are very acid and require applications of four or five tons of limestone per acre, and are very low in available phosphate and potash. Alfalfa production is not successful on most of these soils because of poor drainage conditions.

#### AREA VII - Cut-over Area - 3,052,749 Acres

The soils of this area are largely sands, sandy loams, or loams of rather low agricultural value. Many of them are too stony for cultivation. For the purpose of this report, no attempt was made to suggest changes in land use and management in this area, since information regarding physical soil conditions was extremely limited.

Some areas such as the Antigo flats, sections in Polk, Langlade and Shawano counties and Superior clay areas in Ashland county are highly developed agricultural sections and can undoubtedly be continued as such.

In many sections zoning ordinances have been enacted and an isolated settler purchase program has been carried on to remove farm operators from submarginal and isolated tracts. Before a recommended program for this area can be developed more physical soil and economic information is needed.

## Acreages of Land in Crops and Pasture in Terms of Use Capability

Data presented in Table 1 was furnished by the Soil Conservation Service and is used in this report to show by general land resource areas the acreages at present in cropland, permanent pasture, woodland and idle land by land use capability classes. Basic information on soil types or groups, percent slope and degree of erosion, available from detailed and reconnaissance soil conservation surveys conducted by the Soil Conservation Service, information on soil types published in soil survey reports of the Wisconsin Geological and Natural History Survey and United States Department of Agriculture Bureau of Chemistry and Soils and 1940 Census data on land use were used to estimate the various land use capabilities.

The seven land use capability classes are used here to indicate problems or hazards involved in the management of the agricultural lands of the state and are defined as follows:

Class I. Land which can be rather easily managed when cropped. Most problems arising can be handled with crop rotations, tillage methods and lime fertilizer. Such soils are generally free of stones and other impediments to cultivation. Crop production is not impeded by a high water table. Erosion is generally not a particular problem on these soils.

Class II. Land which presents a difficult management problem if it is to be maintained as productive cropland. Soils in this class may be subject to deterioration if cropped too heavily, either through erosion or destruction of soil structure. Some soils may need artificial drainage or provision for the safe removal of surplus water. More consideration must be given to the application of lime and fertilizer and to soil conserving crop rotations. Where erosion is a problem the necessary supporting mechanical soil conservation practices should be applied.

Class III. Land which presents a severe problem in management if it is to be used for cropland. All a farmer's ingenuity should be employed to continue these soils in a productive state. Applications of lime, where needed, and of fertilizer should be made frequently and in rather heavy amounts. Crop rotations should be planned to meet the conditions peculiar to the particular soil, whether it be a predominance of vegetative cover for erosion control or the use of

crops to improve soil structure. Supporting mechanical soil conservation practices or drainage facilities may also be needed in the management scheme.

Class IV. Land in this class presents a management problem which is generally so great or so troublesome that the land can best be handled in permanent hay or pasture. Re-seeding or renewing hay or pasture is usually necessary every five or six years and may be done by cropping occasionally to corn and grain crops.

Class V. Land in this category is not suitable for cultivation because of high water table, frequent overflow or lack of underdrainage.

Class VI. Land in this class is best suited for pasture or woodland because of steepness or slope, shallow drouthy or infertile soils and eroded condition, or because of the presence of impediments to cultivation such as stones or extreme heaviness. Where good grazing management is employed it may be safely used for pasture; if this is not feasible it can best be handled as woodland.

Class VII. Land not suitable even for pasture except with very careful grazing management. Many of the soils in this group are so sandy or drouthy in nature or so badly eroded that adequate vegetative protection can only be provided by maintaining them in woodland.

The data presented in Table 1 indicates certain maladjustments in land use. Approximately 1,366,000 acres of Class V, VI and VII land are maintained in cropland at present. Likewise, a considerable acreage now in Classes I, II and III is kept in permanent pasture or is idle. A shift from the cultivation of the more hazardous cropland to pasture and a conversion of the better pasture land to rotation cropland is highly desirable if proper land use is to be attained.

#### Acreage of Major Crops and Important Recent Changes

Acreages in crops grown in 1943 are shown in Table 2. The most important recent shift, obviously due to war demands, in the types of crops grown has been an increase in corn acreage which has been offset in part by a decrease in the



PRESENT LAND USE ACREAGES IN THE GENERAL LAND RESOURCE AREAS

# BY LAND USE CAPABILITY CLASSES

[illegible]

# PRESENT LAND USE ACREAGES IN THE GENERAL LAND RESOURCE AREAS

## BY LAND USE CAPABILITY CLASSES

| LAND USE<br>CAPABILITY<br>CLASSES | I     | II      | III     | IV       | V        | VI         | VII     | TOTAL     |
|-----------------------------------|-------|---------|---------|----------|----------|------------|---------|-----------|
|                                   |       |         |         | AREA V   |          |            |         |           |
| Cropland                          | 1,495 | 61,284  | 128,867 | 202,344  | 12,962   | 31,219     | 33,119  | 1,041,680 |
| Pasture                           | 223   | 17,456  | 60,159  | 109,006  | 39,142   | 68,085     | 20,929  | 471,290   |
| Woodland                          | 31    | 8,097   | 24,416  | 73,501   | 29,979   | 42,392     | 49,242  | 315,000   |
| Idle                              | -     | -       | 936     | 11,144   | 9,698    | 2,978      | 4,976   | 225,658   |
|                                   |       |         |         | AREA VI  |          |            |         | 29,732    |
| Cropland                          | -     | 342,556 | 460,434 | 219,265  | -        | 108,527    | 25,347  | 2,484,185 |
| Pasture                           | -     | 107,375 | 251,545 | 271,775  | -        | 163,910    | 67,370  | 1,156,129 |
| Woodland                          | -     | 51,638  | 90,514  | 83,609   | -        | 67,998     | 172,322 | 861,975   |
| Idle                              | -     | -       | -       | -        | -        | -          | -       | 466,081   |
|                                   |       |         |         | AREA VII |          |            |         | -         |
| Cropland                          | -     | 129,906 | 565,492 | 189,283  | 810      | 28,003     | 93,136  | 3,052,749 |
| Pasture                           | -     | 66,265  | 482,826 | 212,991  | 79,532   | 190,560    | 88,968  | 1,006,631 |
| Woodland                          | -     | 66,480  | 268,691 | 82,068   | 28,033   | 121,954    | 364,759 | 1,114,142 |
| Idle                              | -     | -       | -       | -        | -        | -          | -       | 931,976   |
| State Total                       |       |         |         |          |          |            |         |           |
|                                   |       |         |         |          | Cropland | 10,953,320 |         |           |
|                                   |       |         |         |          | Pasture  | 6,083,099  |         |           |
|                                   |       |         |         |          | Woodland | 4,119,024  |         |           |
|                                   |       |         |         |          | Idle     | 268,717    |         |           |
| Total Acres in Farms              |       |         |         |          |          |            |         |           |
|                                   |       |         |         |          |          | 21,424,160 |         |           |

acreage of hay. The total acreage in crops has increased slightly since the beginning of the war. The acreage of potatoes has been much smaller in recent years although the 1943 acreage was larger than for the years immediately preceding. The acreage of "war crops" such as soy beans and hemp has shown a high percentage increase but the total acreage in the state still is relatively small.

Table 2

Present Acreages

| Area  | Row Crops | Small Grain | H a y     | M i s c. | T o t a l |
|-------|-----------|-------------|-----------|----------|-----------|
|       | % 1000    | % 1000      | % 1000    | % 1000   | 1000      |
| a     | Acres     | Acres       | Acres     | Acres    | Acres     |
| I     | 25 464.5  | 37 687.5    | 38 706.0  | - 40     | 1898.0    |
| II    | 33 1230.9 | 38 1417.4   | 29 1081.7 | - 270    | 4000.0    |
| III   | 18 245.7  | 46 627.9    | 36 491.4  | - 97     | 1462.0    |
| IV    | 30 254.1  | 38 321.9    | 32 271.0  | - 80     | 927.0     |
| V     | 24 106.8  | 44 195.8    | 32 142.4  | - -      | 445.0     |
| VI    | 16 173.6  | 37 401.4    | 47 510.0  | - 70     | 1155.0    |
| VII   | 15 141.9  | 31 293.3    | 54 510.8  | - -      | 946.0     |
| State | 30 3175   | 30 3282     | 35 3819   | 5 557    | 10,833    |

The proportion of crops varies considerably from area to area. In Area II about one-third of the cropland is in row crops as compared with one-seventh of the cropland in Area VII. Less than one-third of the cropland in Area VII is in small grains as compared with nearly one-half of the cropland in Areas III and V. The percentage of cropland in hay ranges from twenty-nine percent in Area II to over fifty percent in Area VII.

From the standpoint of total digestible nutrient production, the proportion of small grain seems to be too high and the percentage of corn and hay seems to be too low.

## Nature and Extent of Soil Erosion, Soil Depletion and Misuse

The dynamic cause of soil erosion is, of course, the torrential rains that come with our continental climate. The people who settled on Wisconsin farms came from central to northern Europe where the oceanic climate did not produce the type of rains that caused soil erosion. Because of this origin, our farmers failed to appreciate the damage that the torrential rains could do to soil when the virgin forest and prairie cover were removed. There was nothing in their training or traditions of farming that would make them appreciate the need for erosion control and naturally, there was also nothing in their training that would teach them methods of combating soil and water losses. These facts results in all land, steep as well as level, being taken up and used indiscriminately for all crops. This led to a great deal of soil abuse in the common terms with which we now look upon land use practices. General surveys for determining the extent of soil erosion reveal the following important facts. The blanket of soil was relatively thin and in some areas was underlain by gravelly till and in other places by bed rock. It now appears that about 33% of the cropland of the state has lost an average of a furrow slice of soil. An equal loss has occurred on probably 25% of the pasture land. More than seven million acres of our farm land has been definitely damaged by soil erosion.

In a more careful study of the rate of soil losses, we, of course, find many different factors. The soil of the LaCrosse Experiment Station which represents windblown soils of a considerable area of our tillable land was compared with the soils of other erosion experiment stations a few years ago. It was rated as the most erodible soil found on any of these stations. This is, of course, directly representative of a considerable part of the soil in the unglaciated area. The Miami and Bellefontaine soils, originally timber-covered, of eastern Wisconsin, appear to be practically equally erodible.

The southwestern portion of the state (Area I) is rough and unglaciated. Here obviously the steepness of the land is a very material factor in the rate of soil loss. A higher percent of our local farmers in the area appreciate the problem. Any casual observer can readily be convinced that erosion is a problem in that portion of the state but the eastern part of the state (chiefly Area II) is relatively much smoother and very few farmers and casual observers appreciate that there is a rather high percentage of cropland in that area that is as steep as the cropland in use in Area I. The topography is less bold but a great deal of sloping land is in cultivated crops.



Another practice in Wisconsin farming has led to a smug feeling as far as the loss from erosion can be evaluated. Wisconsin has had diversified livestock farming and diversified crops for upwards of half a century and the feeling has become prevalent that wherever crops are diversified and a large percentage of hay grown, the farmer will never have an erosion problem. This fact of diversification, of course, does help in converting the farmer to conservation farming after he appreciates that he has a problem. But the fact of his having had rotations does offer sales resistance.

Livestock farming depletes soil fertility more slowly than cash crop farming but Wisconsin farmers have a definite feeling that livestock farming with intelligent use of the manure actually eliminates depletion of plant food. This has led to a feeling of safety and there has accordingly been a great deal of resistance to the use of commercial fertilizers. Progress has been made in the use of commercial fertilizers because an Extension project in this field has been in operation for some thirty-five years. Even now, however, only about one-quarter as much commercial fertilizer is being used in the state annually as ought to be used to maintain the plant food at the level that appears desirable for good efficient farming.

The biggest single land abuse, we believe, has been the neglect of pastures. Common conception with the farmer ever since livestock farming was adopted in the 1870's has been that pasturing land is resting it. He has failed to appreciate that pasturing land removes plant food. Pasture acreage has often been too small and resulted in over-grazing. Droughty seasons have added very measurably to the abuse of over-grazing.

War crops have added in a minor way to soil depletion. The one crop, hemp, has generally placed on the level, dark-colored soils. This has probably resulted in forcing an equal acreage of corn to the steeper, more rolling and less adapted land. There has been an increase in acreage of canning crops such as sweet corn, tomatoes, beans and peas. These practices have led to a little higher rate of soil depletion but cannot be blamed for the major depletion that has occurred.

#### Size and Type of Farm

Farms of Wisconsin are mostly small in size. These small farms can give their operators larger incomes when the crop products are marketed through the dairy herd than would be possible if marketed directly. Dairy farming requires much labor. More hours of labor are required to take care of a dairy herd than

for equal numbers of other classes of livestock. This also increases the volume of business upon a given size farm and offers opportunity for larger farm incomes than would otherwise be possible.

Although Wisconsin is essentially a dairy state and dairy farms predominate in practically every county, there are concentrations and variations of sufficient importance in the distribution of both crops and livestock to change the problems involved in managing the farms. Variations arise not only because of local differences in topography, soil, weather, and markets but also because of racial traits or personal preferences of the farmers who are farming in these areas. These differences are reflected in a differentiated land utilization, variations in number and kinds of livestock, and altered combinations of crops and livestock in the various areas of the state.

Approximately 71% of all farms of Wisconsin are classed as "dairy" farms - that is, as having more than 40% of their income from the sale of dairy products. Another 12% are classed as "general" farms. These farms sell several products, no one of which accounts for more than 40% of the gross income of the farm. The usual sales of these farms are dairy products along with some other form of livestock. Another 3% of the farms are classed as "animal specialty" farms. The sale of cattle, hogs, or sheep to the extent of 40% or more of the gross farm income constitutes an "animal specialty" farm. Many of these animal specialty farms also keep some dairy cattle. These three types of farms account for nearly 86% of the farms of the state.

Dairying is the predominant type of farming in Area I, but in the southern section of this area, hog, poultry, or beef production are important enterprises and in the vicinity of Westby considerable tobacco is grown. The farms average from about 150 acres in the southern part of the area to 140 acres per farm with 60 acres of cropland in the northern section.

Dairying also predominates in Area II. The milk supply is used for the production of foreign types of cheese in the south central part of the state; most of the milk in the southeastern section of the state is marketed as fluid milk and in the eastern section American cheese is produced. Tobacco is grown in Dane County and truck gardening is important in the Chicago-Milwaukee area. Farms in the area average about 100 acres with about 55 acres in cropland.

As in the other areas of the state, dairying is the most important enterprise in Area III. Barley is sold for brewing

purposes. Farms average 100 acres with 55 acres in crops.

Potato production is probably the most important secondary enterprise in Area IV. Beef cattle and feeder-pig production are important on some farms. The farms in this area average about 140 acres with 50 acres in crops.

Dairying is a specialty on nearly all farms in Area V and VI, secondary enterprises being relatively unimportant. Farms in this area average about 130 acres, with 60 acres in crops.

Area VII covers the northern part of the state, much of which is undeveloped agriculturally. The northeastern section of the state is predominately a dairy-potato producing section and the northwestern section is frequently classified as a dairy-hay section. Agriculture is relatively unimportant in this area (Area VII) except in localized areas. Farms average about 105 acres with about 35 acres in crops.

#### Prevailing Land Management Practices

1. Rotations: The average crop rotation for the state at present based on percentages of row crops, grain crops and hay shown in Table 2, would approximate a three-year rotation of corn, grain and hay. While this rotation may be adequate on some of the more level highly-productive land, as an average for the state, insufficient amounts of legumes and grasses are included to maintain organic matter or provide enough vegetative protection to control erosion on the greater proportion of the land. Likewise, the prevailing problem of shortage of protein feeds can be met, in part at least, through the increased use of legumes, particularly alfalfa. The trend in recent years has been gradually toward an increase in the percentage of hay, particularly on the steeper more erodible lands. In many sections, the length of the meadow in the rotation has been limited to one or two years, because of acid soil conditions which have restricted the choice of hay and pasture crops to the more acid tolerant biennial legumes such as alsike and red clover.

2. Use of Lime and Fertilizer: Definite progress has been made in the use of lime and fertilizer in the state during the past several years. In 1936 an estimated 682,000 tons of lime was spread by farmers in the state. In 1937, 600,000; in 1938, 476,000 tons; in 1939, 396,000; 1940, 771,000; 1941, 1,000,000 tons; and in 1942, 1,600,000 tons. Production in 1943 is estimated to have dropped off to around 1,000,000 tons because of shortage of labor and equipment used in crushing operations. While there has been a definite increase in the use of limestone, the amount used falls short of the annual maintenance requirement which is estimated at 2,180,000 tons.



The use of fertilizers has been on the increase also during recent years and an estimated 132,000 tons were used in the state in 1942 and 175,000 tons in 1943. This is far short of the 500,000 tons which is considered necessary to replace annual fertility losses.

3. Pasture Improvement: Pasture improvement and renovation has been demonstrated throughout the state as an efficient production and conservation practice. Some progress has been made by farmers along these lines. However, intensive education and further demonstration is needed to convince farmers that pasture land, when properly treated and managed, can produce as much or more net income as cropland.

#### Prevailing Farm Management

As was stated in the discussion on types of farming, dairying is the major source of income in all sections of the state. Exceptions of individual farms with higher incomes from other sources can be found in many localities. In 1936, gross income averaged only slightly over \$1000 per farm in northern Wisconsin to slightly more than \$2600 in the southern part of the state. Earnings are probably twice these amounts at the present time but the differences among the different areas are probably even greater than they were in 1936.

Dairy cows obtain from 30 to 50 percent of the feed through grazing on permanent pastures, rotation pastures, hay meadows, and crop aftermath. The type of pastures used differs in the various parts of the state. In many sections the supply of permanent pastures provides sufficient summer forage while in other sections rotation pastures are used almost exclusively. Different methods for pasture improvements must therefore be used in the different areas.

The type of production of crops, livestock, and livestock products in the various sections of the state is determined by market conditions as well as physical production factors. Changes in the production program which are likely to come as the result of planning for soil conservation are not likely to require changes in market facilities.

The percentage of owner-operators of farms is higher in the cut-over regions of northern Wisconsin and in the poorer land areas further south than it is in the better agricultural areas. Obviously more difficulty is encountered in getting cooperation for programs of soil conservation on rented farms. The reasons need not be enumerated here. However, since tenancy is a desirable part of the agricultural ladder, effort should be put forth



to improve lease arrangements to permit a more thorough and more rapid acceptance of a soil conserving system of farming on rented farms.

Operating units are small in all parts of the state and individual farm plans which call for a reduction in the acreages in crops or in effective pasture acreage is likely to aggravate the handicaps of inadequate size on many farms.

## B - DIRECTION OF NEEDED ACTION

The activities to be undertaken in the demobilization period should be part of a long-time land use and management program. Certain shifts will be necessary for proper utilization of the state's land resources. Table 3 indicates the shifts necessary by general land resource areas. The suggested long-time adjustment in land use for the entire state calls for 9,414,000 acres now in cropland to be left in cropland and 1,861,000 now in pasture to be utilized as cropland in rotation, making a total of 11,275,000 acres of cropland. This represents an increase of 322,000 acres of cropland over the present 10,953,000 acres. This is brought about by (1) converting the 1,861,000 acres now in pasture to cropland, which will involve the installation of drainage facilities on approximately 1,000,000 of these acres; (2) seeding 1,053,000 acres now in cropland, woodland, or idle to permanent pasture and (3) planting 485,000 acres now in badly eroded or sandy and droughty cropland to trees and converting to woodland. Pasture land will total 4,696,000 acres, a decrease of 1,386,000 acres from the present figure. This is the result of (1) converting 1,861,000 acres of present pasture or idle land to cropland; (2) seeding 1,053,000 acres now in cropland or idle to pasture and (3) planting 579,000 acres now in badly eroded or sandy and droughty pasture to trees and converting to woodland. Woodland will total 5,452,000 acres; an increase of 1,333,000 acres. This change is the result of (1) converting 81,000 acres of woodland to pasture; (2) planting 1,414,000 acres of trees on former cropland, pasture, or idle land, and managing as woodland. The adjustments made by areas is shown in Table 3. A comparison of Table 1 with Table 4 indicates the changes which will take place in the acreages of the various land use capability classes by general land use areas as a result of the suggested program.

The most serious change in land use from a farm management standpoint will result from the reduction in pasture acreage. However, this loss in pasturage will be more than offset by the increase in cropland on which increased acreages of hay and rotation pasture will be produced. Further discussion of the changes recommended on cropland is included in the next section of the report.

Plans for the management of crop and pasture lands should be inaugurated concurrently with adjustments in land use. This land management program should include (1) the adjustment of acreage of crops for the various land resource areas consistent with crop rotations that will maintain production on the soil conditions found in each area; (2) the use of lime on acid soils to

TABLE 3

## SUGGESTED LONG-TIME ADJUSTMENT IN LAND USE

## BY LAND RESOURCE AREAS

|       | CROPLAND                           |                                     |            |                                   | PASTURE                                  |           |                                    | WOODLAND   |           |  |
|-------|------------------------------------|-------------------------------------|------------|-----------------------------------|--|-----------|------------------------------------|--|-----------|--|
|       | Now in<br>Cropland<br>to<br>Remain | Now in<br>Pasture<br>to<br>Cropland | Total      | Now in<br>Pasture<br>to<br>Remain | Now in<br>Crop. or<br>Idle to<br>Pasture | Total     | Now in<br>Woodland<br>to<br>Remain | Now in<br>Crop., Idle<br>or Pasture<br>to Woodland | Total     |  |
| I     | 1,669,954                          | 470,507                             | 2,140,461  | 1,119,259                         | 244,423                                  | 1,363,682 | 1,035,329                          | 254,034  | 1,289,363 |  |
| II    | 3,612,651                          | 641,505                             | 4,254,156  | 505,384                           | 307,114                                  | 812,498   | 525,732                            | 191,178  | 716,910   |  |
| III   | 1,366,665                          | 269,468                             | 1,636,133  | 193,469                           | 58,162                                   | 251,631   | 352,473                            | 36,721   | 389,194   |  |
| IV    | 561,266                            | 42,968                              | 604,234    | 135,000                           | 92,529                                   | 227,529   | 500,765                            | 658,990  | 1,159,755 |  |
| V     | 393,990                            | 77,838                              | 471,828    | 163,944                           | 23,596                                   | 187,540   | 225,658                            | 156,664  | 382,322   |  |
| VI    | 802,990                            | 358,920                             | 1,161,910  | 441,636                           | 327,792                                  | 739,428   | 466,081                            | 116,766  | 582,847   |  |
| VII   | 1,006,631                          | -                                   | 1,006,631  | 1,114,142                         | -  | 1,114,142 | 931,976                            | -  | 931,976   |  |
| TOTAL | 9,414,147                          | 1,861,206                           | 11,275,353 | 3,642,834                         | 1,053,616                                | 4,696,450 | 4,038,014                          | 1,414,353  | 5,452,367 |  |

### SUGGESTED LONG-TIME USE FOR THE GENERAL LAND RESOURCE AREAS

### SUGGESTED LONG-TIME USE FOR THE GENERAL LAND RESOURCE AREAS

[illegible]

## BY LAND USE CAPABILITY CLASSES

[illegible]

1870

1871

1872

1873

1874

1875

1876

1877



promote the growth of good crops of legumes; (3) the use of fertilizer in sufficient quantity to take care of plant food losses; (4) the use of supporting mechanical conservation practices such as contouring, contour strip cropping and terracing; (5) the drainage of lands that can be feasibly drained for the production of a higher percentage of clean-tilled and grain crops to take the "load" off the steeper, erodible upland soils; (6) a pasture improvement and management program; (7) the control of gullies where damage is occurring on agricultural land; (8) the purchase and development of submarginal land and relocation of isolated settlers by public agencies where such will promote better land use and serve local interests; (9) the improvement of game resources through wildlife practices on cropland, pasture, woodland and other areas; (10) a flood control program on upstream watersheds; and (11) a research program on crop and pasture land management, including erosion control, to develop new and improved methods.

The job to be done and estimates of how much of it should be attempted in a two-year period following the war is included in Section III. No attempts have been made to evaluate the costs of each measure or practice as compared to the benefits expected to accrue. The measures and practices are necessary to achieve the long-time objectives, and in most cases, will return greater benefits than the cost of installation if such costs are spread over a long period of time.

## C - PLANS FOR CROP AND PASTURE LAND

Summaries of the long-time land management practices and the amounts of each, together with labor, materials and equipment over and above what the farmer normally has at his disposal, needed in a two-year post-war period are included in Table 6 for the state as a whole. The figures are broken down by general land resource areas in Tables 7 to 13, inclusive.

The program set up in these tables, and more fully described in the ensuing pages, does not purport to show who or what agencies will do what, or how the measures or practices will be put into effect or financed, nor does it attempt to show how much of each a farmer will accept and apply. Rather, the program shows what should be done in the two-year period if the long-time objective is to be achieved. How much can be done will be materially influenced by the farmer's financial condition and economic conditions in the post-war period. To accomplish this much, additional facilities, technical personnel, labor, materials, equipment may be required and the cooperation of local, state and federal agencies and organizations in educational and action programs will be necessary.

### Capital Improvements

#### Erosion Control and Run-off Retardation.

To maintain productivity and promote erosion control on cropland certain shifts in crops should be made. The following table (Table 5) shows a breakdown of the acreage of crops based on the suggested long-time program:

TABLE 5

| Area  | Row Crops |        | Small Grain |        | Hay & Rot. Past. |        | Total    |
|-------|-----------|--------|-------------|--------|------------------|--------|----------|
|       | 1000      |        | 1000        |        | 1000             |        | 1000     |
|       | %         | Acres  | %           | Acres  | %                | Acres  | Acres    |
|       |           |        |             |        |                  |        |          |
| I     | 27        | 577.9  | 23          | 492.3  | 50               | 1070.3 | 2140.5   |
| II    | 36        | 1531.5 | 20          | 850.8  | 44               | 1871.9 | 4254.2   |
| III   | 31        | 507.2  | 23          | 376.3  | 46               | 752.6  | 1636.1   |
| IV    | 25        | 151.0  | 22          | 132.9  | 53               | 320.3  | 604.2    |
| V     | 22        | 103.8  | 22          | 103.8  | 56               | 264.2  | 471.8    |
| VI    | 22        | 255.6  | 22          | 255.6  | 56               | 650.7  | 1161.9   |
| VII   | 15        | 141.9  | 31          | 293.3  | 54               | 510.8  | 946.0    |
| State | 29        | 3268.9 | 22          | 2505.0 | 49               | 5440.8 | 11,244.7 |



Row crops, when compared with present figures (Table 2) show an increase for the state of 93,000 acres, but since the total cropland is increased by some 322,000 acres in the suggested program, the percentage of row crops in crop rotations will actually be reduced slightly from 30% to 29%. A decrease of 777,000 acres of grain and an increase of 1,621,800 acres of hay will result from the long-time program. It will be possible to increase the row crop acreage and at the same time promote soil conservation by (1) the drainage of approximately 1,000,000 acres of level land which can be farmed more intensively to row crops with less need for these crops on the steeper land and (2) by the adoption of supporting conservation practices such as contour strip cropping or terracing on upland soils. Since from a farm management standpoint it is considered more profitable to grow corn than the small grains, the maximum amounts of row crops consistent with good soil conservation practices were used in designing rotations for the compilation of figures in Table 5. This resulted in a decreased acreage of grain. The acreage of hay is increased because crop rotations including more forage crops are needed on cropland to aid in erosion control and maintain the soils in a productive state as well as to supply a cheap source of high protein feed. The acreage of Class IV land at present in cropland (see Table 4) was maintained in cropland and should be farmed to a long rotation with four or five years of hay or rotation pasture occupying the land during a six-year period. This also accounts for the increased amount of hay.

The long-time program as far as these changes are concerned cannot be made in a short period of time. However, in the post-war period of two years soil conserving rotations should be applied on ten percent of the cropland and 508,600 acres, or one-third of the Class IV land should be seeded to alfalfa-bromegrass.

#### Lime for Crop and Pasture Land

The total lime needs of the state have been estimated for the general land resource areas using as a basis the summary of state-wide county soil testing project sponsored by the Wisconsin College of Agriculture and set up under the supervision of the Works Projects Administration.

During the period October 1, 1938 to December 31, 1942, a total of 252,327 soils were tested. These indicate that 65% of the soils of the state were acid. The percentage of soils in each general land resource area needing lime were estimated from these tests and this information is shown in Figure 2, as are the recommended rates for each area.

Of the 11,275,000 acres of cropland in the state, 6,415,000 acres should be limed. It must be pointed out that the estimates made for Area VII in the cut-over section were held down to a figure of 30% inasmuch as only limited information is available from this area and it is questionable whether an extensive liming program should be started here until more is known regarding soil resources. It is also estimated that limestone is needed on 2,756,000 acres which are suitable for pasture improvement. The total lime requirement for cropland is 16,349,000 tons and for pasture, 7,169,000 tons or a total for all farm land of 23,518,000 tons. During the two-year post-war period, 1,283,000 acres, or 20% of cropland and 275,670 acres, or 10% of pasture land, a total of 1,558,670 acres should be limed; 3,269,800 tons on cropland and 716,940 tons on pasture land or a total of 3,986,740 tons will be needed.

Lime will be needed in the greatest quantities in Areas I, II, and VI. An adequate local source is available in Areas II and III, but for the most part, limestone will need to be shipped into Area VI.

#### Fertilizer for Crop and Pasture Land

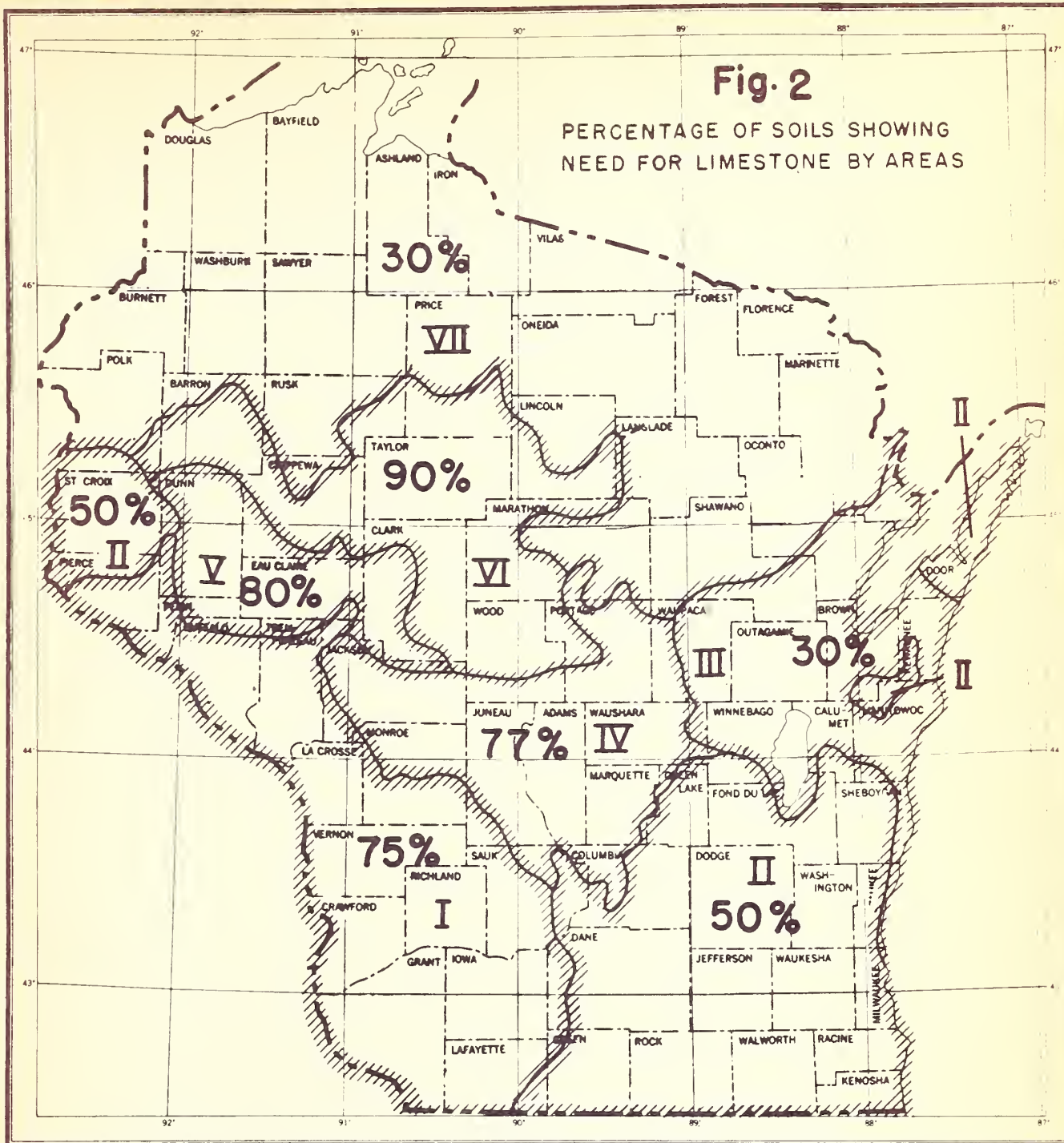
The results of the tests of the state-wide county soil testing project referred to in the discussion of lime, were used as a basis for determining the fertilizer needs. These are indicated in percentages by areas in Figure 3. The annual fertilizer requirements for cropland, based on supplying 100 pounds of mineral fertilizer per acre per year of the rotation on 1,937,000 acres of cropland is 443,000 tons. For pasture improvement it was estimated that 400 pounds of mineral fertilizer per acre should be applied once in ten years on 2,900,000 acres of pasture. On this basis, 63,000 tons should be applied annually on 290,000 acres.

The goal for the two-year post-war period should be based on these annual requirement figures, so a total of 1,012,000 tons will be needed of which 886,000 tons should be applied on cropland and 126,000 tons on pasture. If nitrogen fertilizers are made available in large quantities at a reasonable cost to farmers following the war, appreciable quantities can be expected to be used, on pasture land, where moisture is not a limiting factor.

# GENERAL LAND RESOURCE AREA MAP (PROVISIONAL)

U. S. DEPARTMENT OF AGRICULTURE  
NATURAL CONSERVATION SERVICE  
H. W. BARNETT, CHIEF

UPPER MISSISSIPPI VALLEY REGION  
WISCONSIN  
U. S. BUREAU OF SOIL CONSERVATION



- |                              |                             |
|------------------------------|-----------------------------|
| I. Southwestern Upland Area  | IV. Central Sand Area       |
| II. Glaciated Limestone Area | V. Rolling Sand Area        |
| III. Red Clay Area           | VI. Central Heavy Soil Area |
| VII. Cut Over Area           |                             |



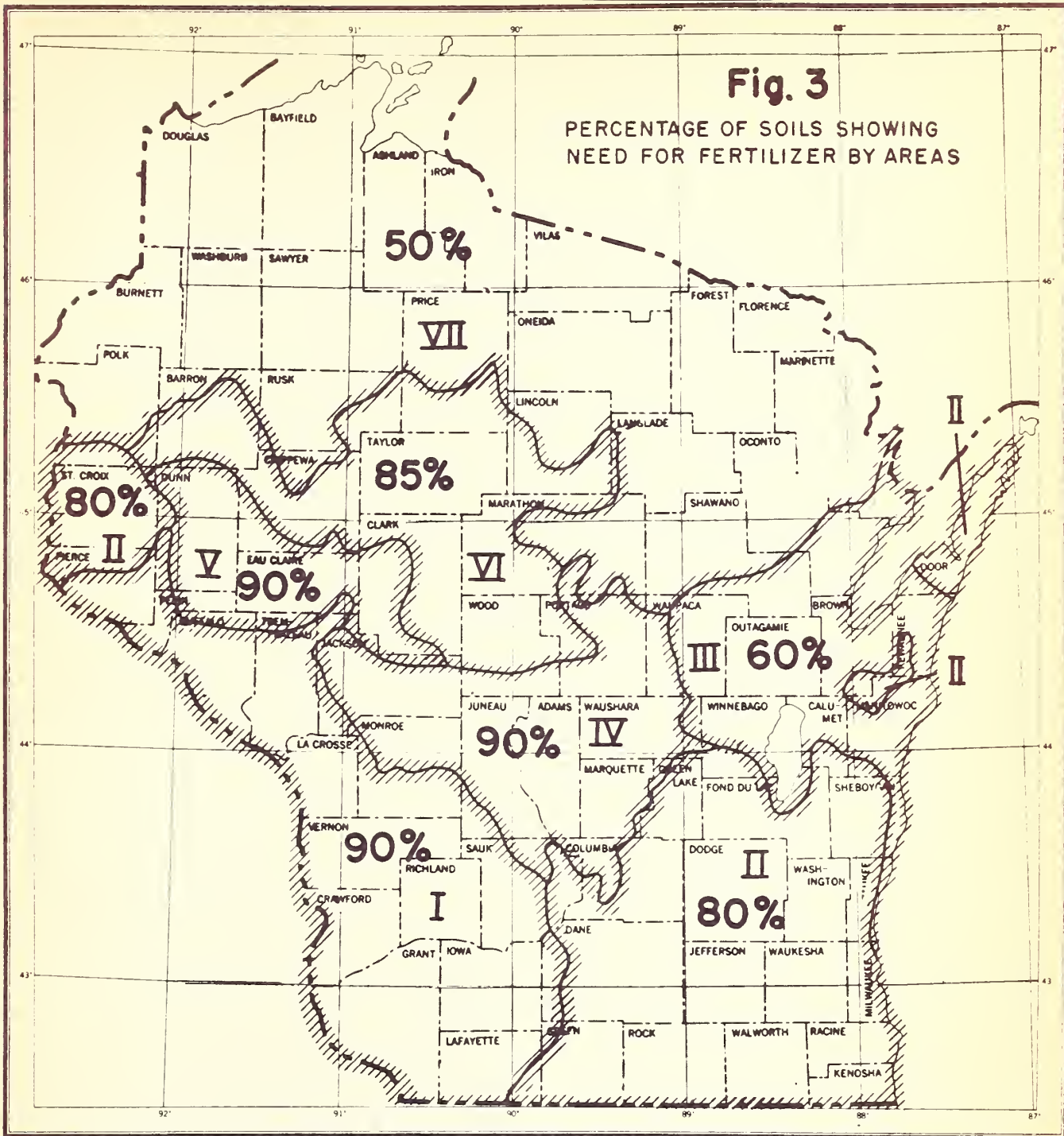


# GENERAL LAND RESOURCE AREA MAP

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
U. S. GOVERNMENT PRINTING OFFICE

(PROVISIONAL)

UPPER MISSISSIPPI VALLEY REGION OF  
WISCONSIN  
S. H. MUEHL, SOIL MAP CORRELATOR



Reference Generalized soil maps of  
state of Wisconsin

SCALE IN MILES  
0 25 50 75

- |                              |                             |
|------------------------------|-----------------------------|
| I. Southwestern Upland Area  | IV. Central Sand Area       |
| II. Glaciated Limestone Area | V. Rolling Sand Area        |
| III. Red Clay Area           | VI. Central Heavy Soil Area |
| VII. Cut Over Area           |                             |





It is estimated that 3,192,000 acres of permanent pasture in the suggested long-time plan could be improved. Of this 2,138,500 acres could feasibly be renovated or improved through lime, fertilizing and re-seeding to alfalfa and brome-grass and 1,053,600 acres now in cropland should be seeded to permanent pasture and maintained in productive pasture through renovation. In the two-year post-war period, 213,000 acres of permanent pasture should be renovated or re-seeded and 210,000 acres should be converted from cropland and seeded to pasture. The total seed requirements for this improvement program are listed in the following section.

#### Seed Needs for Cropland and Pasture

The suggested land management program on cropland involves an increase annually of 1,525,600 acres above the present hay acreage. This increase will largely result from maintaining the Class IV land now in cropland in a six-year rotation with four or five years of hay or pasture and one or two years of grain. It is estimated that the normal supply of forage crop seed used annually will be adequate for the remaining cropland. Thus, seed over and above the normal supply will be needed annually for seeding 254,300 acres of Class IV cropland, which is one-sixth of the above-mentioned figure. With a seeding rate of eight pounds of alfalfa and eight pounds of brome-grass per acre, 33,900 bushels of alfalfa and 145,300 bushels of brome-grass are required. This represents the additional seed required annually for cropland.

It is estimated that of the total of 4,696,000 acres of permanent pasture in the suggested long-time program, 2,138,000 acres should be improved through renovation or by re-seeding with alfalfa and brome-grass and 1,053,000 acres now in cropland should be seeded to alfalfa-brome-grass pasture. This represents a total of 3,192,000 acres needing improvement. It is estimated that during a two-year period following the end of the war, 20% of the 1,053,000 acres now in cropland or idle, or 210,720 acres should be seeded to pasture. In addition, 64,100 acres or 10% of the Class IV land now in pasture, in Areas I to V, inclusive (see Table 1), should be seeded to an alfalfa-brome-grass mixture. Of the remaining land in pasture, 1,497,500 acres could feasibly be renovated; and 10% of this or 149,750 acres should be renovated with a sweet-clover-red clover-timothy mixture during this two-year period. No recommendations have been included for pasture improvement in Area VII.

The annual requirements of the various grass and legume seeds in bushels for crop and pasture land will be as follows:

|   | ALFALFA<br>Bu. | SWEET<br>CLOVER<br>Bu. | RED<br>CLOVER<br>Bu. | ALSIKE<br>& WHITE<br>CLOVER<br>Bu. | BROME-<br>GRASS<br>Bu. | TIMOTHY<br>Bu. |
|---|----------------|------------------------|----------------------|------------------------------------|------------------------|----------------|
| Hay & Pasture   |                |                        |                      |                                    |                        |                |
| Seedings on   | 33,900         | -                      | -                    | -                                  | 145,300                | -              |
| Cl. IV now in<br>Cropland   |                |                        |                      |                                    |                        |                |
| Conversion of<br>Cropland to<br>Pasture                           | 11,210         | -                      | 2,100                | 1,425                              | 35,190                 | 370            |
| Reseeding Cl.<br>IV Land now<br>in Pasture                        | 4,270          | -                      | -                    | -                                  | 18,315                 | -              |
| Renovation of<br>Remainder of<br>Past. Feasible<br>for Renovation | -              | 14,975                 | 4,990                | -                                  | -                      | 6,655          |
| Additional Seed<br>over Normal<br>Used                            | 49,380         | 14,975                 | 7,090                | 1,425                              | 198,805                | 7,025          |
| Normal Used   | 130,000        | 22,000                 | 130,000              | 22,000                             | 2,000                  | 125,000        |
| Total Seed<br>Needed<br>Annually                                  | 179,380        | 36,975                 | 137,090              | 23,425                             | 200,805                | 132,025        |

To inaugurate the suggested program a substantial increase in amounts of alfalfa, sweet clover and brome grass seed should be made available in the state.

#### Contour Strip Cropping on Cropland

3,097,300 acres of contouring and contour strip cropping are needed on the cropland of the state. Areas I, II and VI indicate the greatest need for this practice. During the two-year post-war period, 309,730 acres of strip cropping should be applied.

## Wind Strip Cropping on Cropland

A total of 604,800 acres of wind strip cropping are needed on the sandy lands of the state. Most of this is located in Area IV where the need for 425,000 acres of this practice exists. Ten percent of the total needed or 60,480 acres should be applied during the two-year post-war period.

## Terracing on Cropland

Terracing should play an even more important part in the conservation program of the state in the future. Farmers in the state have been slow to accept this practice because it generally appeared too complicated for them. However, on many acres of upland, adequate control cannot be obtained with any other conservation practice. During recent years, methods have been developed whereby farmers can construct terraces with a tractor and a plow which has simplified the process and led more farmers to adopt this practice. This method works particularly well on gentle to rolling slopes of deep soils. However, there are many locations in the state where a blade and tractor will be the most economical and best equipment for terrace construction. A total of 964,000 acres of terracing is needed in the state of which 96,400 acres should be applied in the two-year period following the war.

## Water Disposal System

Generally, throughout the state farmers have done a pretty good job of maintaining grassed waterways in sod or reseeding them when small gullies develop. Some attention will need to be paid to the development of terrace outlets if the proposed terracing program is undertaken. The greatest problem in water disposal exists in waterways where the watersheds are large or sharp drop-offs occur, and the surplus water cannot be handled by sod. In many such situations, gullies of considerable size have developed. Control must be provided in the form of concrete or masonry structures. It is estimated that 7,925 large concrete and 16,500 medium to small masonry structures are needed in the state. In the two-year post-war period, 792 large concrete structures and 1,650 small or medium-sized masonry structures should be built. Estimates of materials, labor and equipment are included in Table 6 for the state, in Tables 7 to 13, inclusive, for each area. The estimates for the large structures are based on a 4' x 4' drop inlet with a twenty foot head and 5,000 cubic yards of earth fill and on the small masonry structures on the basis of a 2' x 12' weir, five feet high with a 300 cubic yard earth fill.

U.S. DEPARTMENT OF AGRICULTURE

## Soil Conservation Surveys

Detailed soil conservation surveys should be conducted in Areas I to VI, inclusive, and a reconnaissance survey made in Area VII. After the completion of the latter survey, some detailed surveys will undoubtedly be needed in certain parts of the area. To date, a total of 4,676,064 acres have been surveyed leaving a total of 17,058,355 acres to be completed in the state. To complete the needed detailed surveys for the entire state would require 1634 man months. The reconnaissance survey will require a total of 48 man months. This survey should be completed prior to the post-war period, so that results can be used as a guide in the location of returning war veterans on farms in the area if such is deemed desirable.

During the two-year post-war period, 20% of the land left to be surveyed or 3,410,000 acres should be completed. This will require a total of 327 man months of soil surveyors' time.

## Special Flood Control Structures

To date the Department of Agriculture has done but very little work in Wisconsin to determine the feasibility of special flood control structures to mitigate floods. The only surveys completed are:

Kickapoo River of Crawford, Vernon and Monroe Counties  
(detailed survey)

Black River of Trempealeau, Jackson, Clark, Wood and  
Taylor Counties (preliminary survey)

Neither of these reports has been published nor the data contained in them released. The surveys were made under the direction of a committee composed of representatives of the United States Forest Service (Chairman), Soil Conservation Service and Bureau of Agricultural Economics.

The Kickapoo River lies wholly within Area I, while only a small portion of the Black River is in this area. The remainder of the Black River is in Areas V and VI.

With the meager data available it is felt that considerable study will be necessary before any plan for special flood control structures can be made for the state. It appears that Area I is more suited for such structures than Area II and it is therefore logical to initiate such studies in that area.



## Area I

Brief mention has been made of the feasibility of special flood control structures in the Kickapoo Watershed. It appears there is a possibility of twelve structures being justified. However, no detail plans have been made. Nevertheless, it is estimated that these twelve can be expected to cost \$2,700,000. If the Kickapoo is representative of Area I, 136 structures, at a cost of \$31,000,000 are possible.

It is doubtful if this phase of a flood control program could be completed in less than thirty years. Considerable thought and planning are necessary in the development of such a program. To date none of this has been done. For the first two years after the cessation of hostilities in Europe the work on special flood control structures should be confined to surveys and designs. The total cost of this type of work over the thirty-year period can be expected to be \$4,500,000. However, it is doubtful if over \$100,000 should be spent in the first two years. Since some preliminary work has been done in the Kickapoo Watershed, the surveys should begin in that area first. Upon the initiation of this study, plans for a study of all of Area I should be made. It is felt that this over-all planning phase should be near completion the first year. The survey money recommended the first two years should be divided as follows:

|                         |            |       |
|-------------------------|------------|-------|
| Technical personnel     | - Salaries | - 50% |
| Non-technical personnel | - "        | - 20% |
| Equipment and other     | - "        | - 30% |

## Area II

Since the status of Area II is entirely unknown, the first step in preparing a plan should be that of preparing an over-all plan for the area. Based on the total anticipated costs for special flood control structures in Area I it might be expected that \$20,000,000 could be expended for similar structures in Area II. As in Area I, the completion of a program could not be expected in less than thirty years. It is estimated that the total cost of surveys and plans would be \$3,000,000.

Not over \$50,000 should be spent on plans during the first two years following the cessation of hostilities in Europe. The first of the two years should be devoted to the preparation of an over-all plan for that area. These \$50,000 should be spent as follows:

|                     |   |          |   |     |
|---------------------|---|----------|---|-----|
| Technical personnel | - | salaries | - | 50% |
| Non-technical       | - | "        | - | 20% |
| Equipment and other | - |          | - | 30% |

### Summary

During the first year of work the estimates submitted here should be revised. It is felt that considerably more study should be made on this problem before making detail plans for surveys and designs. During this first year of study, the flood damage problem should be analyzed with the potential sites for special flood control works. Priority of work should be set up based on these results.

### Insect, Disease and Rodent Control

As these types of work are of a continuous nature, handled by individual farmers, season by season, it is hardly possible to set them up in a specific post-war plan. Individual species may cause serious damage locally and insects such as grasshoppers and rodents such as brown rats and pocket gophers may have to be reduced in numbers by community cooperation. Outbreaks are considered as emergencies and can hardly be handled in a program to be put into effect each year of a two-year period.

### Weed Control

The control of weeds such as creeping Jenny, Canada thistle, buckhorn, wild mustard and quack grass should be undertaken with renewed vigor in the post-war period. Shortages of labor, equipment and chemicals during wartime have operated against farmers' gaining much headway in their fight to control these pests. In the two-year post-war period county programs should be developed to cope with the particular local weed control and eradication problems. Equipment and chemicals should be made available to farmers at a nominal cost. Control methods should be recommended which are consistent with sound soil conservation practices. Where control can only be obtained by prolonged periods of cultivation on sloping land, practices such as contour strip cropping or terracing should be encouraged.

The establishment of crop rotations, the use of lime and fertilizer and the improvement of permanent pastures, recommended in the suggested long-time management program will aid materially in the control of many annual and biennial weeds.

The use of high quality clean seed should be encouraged and the present vigorous enforcement of state seed and weed laws should be continued.

## Nurseries for Production of Tree Planting Stock

The requirements estimated below are based on the annual need for tree planting stock on land in operating farms now used for crops or pasture, but upon which a conversion to woodland is contemplated. Two assumptions are made in arriving at these estimates:

No actual planting will be done on private land at public expense, but nursery stock will be furnished to those farmers who desire to do their own planting.

The extent to which farmers will accept the program of converting crop and pasture land to woodland reflects the annual need for planting stock.

Based on the estimated results of an educational program to bring this conversion about, the annual requirements are about as follows:

| LAND<br>RESOURCE<br>AREA | CONIFERS                       | HARDWOODS | TOTAL     |
|--------------------------|--------------------------------|-----------|-----------|
| I                        | 1,000,000                      | 600,000   | 1,600,000 |
| II                       | 500,000                        | 300,000   | 800,000   |
| III                      | 100,000                        | 100,000   | 200,000   |
| IV                       | 2,000,000                      | 300,000   | 2,300,000 |
| V                        | 300,000                        | 150,000   | 450,000   |
| VI                       | 300,000                        | 100,000   | 400,000   |
| VII                      | Planting mostly on public land |           |           |
| Total                    | 4,200,000                      | 1,550,000 | 5,750,000 |

With but little additional cost, the existing State Nursery at Wisconsin Rapids and the Soil Conservation Service Nursery at Winona, Minnesota, can be expanded to supply about one-third of the above requirements. Geographically, however, neither of these nurseries adequately serve the southern third of the state, hence another nursery located in Sauk County to supply the additional needs appears desirable. Further justification for a nursery at this location is that it could produce most of the bulky hardwood stock which will be used primarily in Resource Areas I and II.

Sauk County was selected not only because of its central location, but because some of the land and facilities now in the Badger Ordnance Works could be utilized. The soil of the Sauk Prairie, where the powder plant is located, is well suited for growing nursery stock, water facilities are available, existing buildings, with some modification could be used, and of most importance, there will be a considerable labor pool available in that locality.

For the initial development, the estimated cost of nursery equipment and materials is:

|  |           |
|--|-----------|
| Sprinkler system                         | \$ 20,000 |
| Tools and machinery                      | 10,000    |
| Seed, fertilizer, packing material, etc. | 5,000     |
| Building material and fencing            | 5,000     |
|  | <hr/>     |
|  | \$ 40,000 |

Labor needs for the first year's development are:

|                         |           |               |
|-------------------------|-----------|---------------|
| 150 laborers,           | 8 months  | 100 man years |
| 50 semi-skilled workmen | 12 months | 50 man years  |
| 20 skilled & technical  | 12 months | 20 man years  |

The following year and annually for succeeding years the labor needs are estimated at:

|                       |           |              |
|-----------------------|-----------|--------------|
| 100 laborers          | 6 months  | 50 man years |
| 15 semi-skilled       | 12 months | 15 man years |
| 5 skilled & technical | 12 months | 5 man years  |

---

Total, first two years 240 man years

The possibilities of the above development will be considered with the sub-committee on Use and Disposal of Military Lands.

#### Wildlife Improvements.

Within the crop and pasture areas of Wisconsin, there are many miles of stream and ditch banks that should be stabilized and improved. Most of this work will be of great value to wild birds and animals. There are also several thousand acres of shallow lakes and marshes that are the principal habitat of waterfowl and furbearers. In many instances, water levels may be stabilized and banks of lakes, streams, and ditches improved with the use of vegetation, without interfering with drainage or the use of the land for the designated purposes. It is considered that the major resources involved are public rather than private.

It must be assumed that the plan set up here can be subdivided so that about half will be done the first year and the remainder the following year.

#### Marsh Management -

Applicable to Areas II, III, IV, VI

Acres, 12,000

Work to be done by farmers with a minimum of technical assistance from state and federal agencies.

#### Stream Improvements -

Applicable to Areas I, II, V

Miles, 150

Work to be done by farmers with technical assistance from state and federal agencies.

#### Ditchbank and Spoilbank Management -

Applicable to Areas II, III

Miles, 200

Work to be done by farmers with technical assistance from state and federal agencies.

#### Research in Crop and Pasture Land Conservation

##### Long-time Program

Data on soil and water conservation obtained at the LaCrosse Station are directly applicable to the soils found in problem Area I, and, in general, are applicable to all silt loams in Wisconsin. The long-time plan calls for an expansion of research studies at the LaCrosse Station with outlying experiments in other



problem areas. The data obtained from the outlying experiments will be used to interpret the findings of the experiments at the LaCrosse Station so that recommendations for soil and water conservation may be directly applied to other problem areas.

Experiments at the LaCrosse Station include studies on the following problems:

1. The effect of crop in rotation on soil and water losses and yield of crop on a six percent slope and on a sixteen percent slope.
2. The effect of percent and length of slope on soil and water losses and crop yield measured on three, eight, thirteen and eighteen percent slope.
3. The effect of degree of erosion on soil and water losses and crop yield.
4. The effect of organic-matter treatment on production and soil and water losses on a severely eroded soil.
5. The effect of organic-matter treatments on nutrient and water loss by percolation.
6. The effect of strip-cropping, width of strip, and position of crop on soil and water losses and crop yields.
7. The effect of vertical spacing and channel gradient of terraces, and terracing on soil and water losses and crop yields.
8. The effect of degree of grazing and pasture renovation on soil and water losses and pasture yields.

New studies that would be established:

1. The effect of organic matter and commercial fertilizer on the productivity of an eroded soil. Data available show conclusively that an eroded soil yields appreciably less than an uneroded soil. More than one-third of the state's cropland is severely eroded and is producing only about three-fourths as much as slightly eroded land. This experiment would be designed to determine the most economical method of regaining as much as possible of this lost productivity.

2. A detail experiment to determine the effects of individual strips and combination of strips on the soil and water losses from a strip-crop system. It is known that losses from plots of about the same length as the strip widths are higher than the losses from a strip-cropped field. An experiment designed to obtain losses by strips and by combination of strips would furnish essential basic data that would be invaluable in the conservation program.
3. The effect of length of rotation on soil and water losses and crop yields. This experiment would include measurements on three, four, five and six-year rotations. Very few data are available on the exact effects of increasing the length of rotations. Yet, length of rotation is an important factor affecting soil and water losses.

#### Outlying Experiments

##### Area No. II - Glaciated Limestone

An experiment would be established on moderately eroded Miami silt loam in southeastern Wisconsin to determine the effect of crop in rotation on soil and water losses. Plots would be located on two slopes of different steepness, and would be cropped to a three-year rotation of corn, grain, and hay.

##### Area III - Red Clay

The red clay soils are very young and even in the virgin state low in organic matter. It is therefore impossible to evaluate top soil losses. Visible signs of erosion are small field gullies and outlet gullies next to the more important water-courses. Experiments to study the increase of organic matter would be desirable.

##### Area IV - Central Sand

The control of wind erosion in this problem area is dependent, to a large extent, upon the productivity of the cropland. A study will be made to determine the relative productivity of the various major soil types. Those which are sufficiently productive can be cropped; those which are insufficiently productive would be taken out of crop production. With data available on wind-erosion control, practices could be established on the more productive land, and losses reduced to a minimum.

Nutrient losses as measured by lysimeters to determine losses of fertility. These soils require a fairly high rate of fertilizer application. The high permeability of the sands may allow much of this plant food to be lost by leaching. These losses would need to be known and the seasons of their occurrence, so that fertilizer treatments could be modified accordingly.

#### Area V - Western Rolling Sand

An experiment would be established on a moderately eroded Boone fine sandy loam soil to determine the effect of crop in rotation on soil and water losses. Plots would be located on two slopes of different steepness and would be cropped to a three-year rotation of corn, grain, and hay.

#### Area VI - Central Heavy Soil

An experiment would be established on a moderately eroded soil to determine the effect of crop in rotation on soil and water losses. Plots would be located on two slopes of different steepness, and would be cropped to a three-year rotation of corn, grain, and hay.

#### Area VII - Cut-Over

No experiments are planned for this area due to the fact that erosion control is a minor problem. This is due to the fact that its agriculture is relatively young and the growing season is short. It is believed that erosion will not become a very severe problem in this area.

### Plan of Activity - Two-year Period Immediately Succeeding Close of European War

#### First Year After Cessation of Hostilities

A. The effect of crop and slope on soil and water losses.

1. Problem Area II

2. Problem Area VI

Procedure: Plots would be 72.6 feet long by 20 feet wide. All plots would be planted to a three-year rotation with all crops in duplicate each year. There would be 12 plots on each soil type, or a total of 24 plots in the two problem areas.

Land and equipment needs:

|  |          |
|--|----------|
| Land: 2 acres at each location                               |          |
| 4 acres rental at \$5.00 per acre<br>per year                | \$ 20.00 |
| 2 buildings, small laboratory and equip-<br>ment at \$500.00 | 1000.00  |
| Boundaries, tanks, divisors                                  | 2800.00  |
| Personnel: Labor   | 2000.00  |
| Technical  | 2000.00  |

Second Year After Cessation of Hostilities

A. The effect of crop and slope on soil and water losses

1. Problem Area V

Procedure: Lots would be 72.6 feet long by 20 feet wide. All plots would be planted to a three-year rotation of corn, grain, and hay, with each crop in duplicate each year. There would be a total of twelve plots.

Land and equipment needs:

|   |          |
|---|----------|
| Land: 2 acres rental at \$5.00                | \$ 10.00 |
| Building: Small laboratory and equip-<br>ment | 500.00   |
| Boundaries, tanks, divisors                   | 1400.00  |
| Personnel: Labor                              | 1000.00  |
| Technical                                     | 1000.00  |

B. The effect of length of rotation on soil and water losses and crop yields.

Procedure: Plots 72.6 feet long by 20 feet wide would be established on a moderately eroded soil. Rotations represented would be a three-year rotation of corn, grain, and hay; a four-year rotation of corn, grain, and two years of hay; a five-year rotation of corn, grain, and three years of hay; and a six-year rotation of corn, grain, and four years of hay. Each crop would be represented in duplicate each year, so that there would be a total of 36 plots.

Land and equipment needs;

|                                |          |
|--------------------------------|----------|
| Land: 5 acres rental at \$5.00 | \$ 25.00 |
| Boundaries, tanks, dividers    | 4,200.00 |
| Personnel: Labor               | 3,000.00 |
| Technical                      | 1,000.00 |

Research in Economics of Soil Conservation

Long-Time Program

Economic research of the past seven years and that under way applies generally to the southern section of Area I. The type and extent of erosion damage differs in the various areas. The kinds and proportions of crops grown, the yields per acre, and the types and productivity of pasture land as well as the type of livestock production also varies from area to area. Because of these differences in production, research data obtained in southwestern Wisconsin is not adapted to use in the preparation of soil conservation plans in the other areas.

Data are needed in the central Wisconsin sand area as to the economic and social feasibility of investing soil conservation planning time, as well as lime, fertilizer and other critical materials on the various "grades" of land. Studies are also needed to determine the best farm management practices for each of the different grades of land in this area. The same type of data are needed in Area VI for the "heavy" (poorly drained) soils. In each of these two areas the variation in crop production and consequently in livestock production and income varies tremendously among the different soil groups. Hence, studies need to be made for each soil group.

Pasture, cropland and livestock production relationship in Areas II and III are widely different from those existing in Area I. The problems involved in these are among the most acute problems in soil conservation planning in these areas.

The undulating sand areas of the state present problems of extreme damage from gullies in addition to different needed farm management adjustments. In some parts of these areas the reduction in productivity and in income due to erosion or available plant foods is greater, by far, than for any other section of the state.



Experiences of the past ten years in soil conservation planning of farms show extreme variations in willingness of farmers to adopt soil conserving systems of farming. Some farmers readily accept soil conservation plans and put them into operation immediately, while others do not make use of the available opportunities for initiating needed soil conserving practices. A study of factors that prevent or slow up the acceptance of erosion control measures by farmers would be helpful in accelerating the adoption of soil conserving systems of farming. Such a study should include economic, sociologic, and psychologic factors involved. The studies should be made in areas, such as Coon Creek and Fennimore, in which the soil conserving program has been established for a number of years, and in areas in which the program is just getting under way.

Community or social problems resulting from erosion damage and from the efforts to control erosion are serious in many sections of the state. Inadequate farm units are being operated at the present time with the result that not only are soil losses so enormous that entire communities are seriously threatened but farm incomes are reduced to only a fraction of what is needed for adequate living.

#### Post War Plans

#### Economies of Soil Conservation

#### First Year After Cessation of Hostilities

##### I. Studies of economics of soil conservation

- A. The studies should include total production of the different crops, pastures, livestock and livestock products, including studies of feeding practices of soil conserving and non-soil conserving crops on a selected number of farms grouped according to land use capability.
- B. These studies should be made in each of the other six areas on farms grouped as follows:

- Area II. 1. Less severely eroded farms (40 farms)  
2. Severely eroded farms (40 farms)  
3. Drainage farms (40 farms)

Area III. Typical farms in the area (40 farms)

- Area IV. 1. Farms with Class 1-2 cropland (40 farms)  
2. Farms with an average of Class III cropland (40 farms)  
3. Farms with less than Class IV cropland (40 farms)

- Area V. 1. Well-drained farms (40 farms)  
2. Under-drained farms (40 farms)  
3. Severely under-drained farms (40 farms)

- Area VI. 1. Less severely eroded farms (40 farms)  
2. Severely eroded farms (40 farms)

II. Studies of farmers' attitudes on soil conservation:

These studies should be made on 100 farms in each of the following areas:

Coon Valley, Fennimore, Crawford County, Juneau County, Eau Claire County and Dodge County.

III. Studies should be made on a watershed basis in each of the following areas:

Unglaciaded heavy soil area, unglaciaded hilly light soil area, and central Wisconsin sand area.

|            |           |               |                 |
|------------|-----------|---------------|-----------------|
| IV. Costs: | Personnel | Technical (4) | \$8000          |
|            |           | Clerical (4)  | 5760            |
|            |           | Travel        | 1600            |
|            |           | Miscellaneous | 60              |
|            |           |               | <u>\$15,420</u> |

Second Year After Cessation of Hostilities

Section I should be continued over a period of years as indicated for the first year. Studies outlined in Section II and III should be continued for two years.

|        |           |               |                 |
|--------|-----------|---------------|-----------------|
| Costs: | Personnel | Technical (4) | \$8000          |
|        |           | Clerical (4)  | 5760            |
|        |           | Travel        | 1600            |
|        |           | Miscellaneous | 60              |
|        |           |               | <u>\$15,420</u> |

## NEW LAND DEVELOPMENT

### (1) Land Clearing and Leveling

Any expansion or development of land for farming purposes will be limited largely to Area VII. Inasmuch as information is rather limited regarding physical resources in this area no proposals are made in this report. Before such can be made, more information is needed. Development in this area and in some few scattered sections in other areas is considered rather uneconomic at the present time since the cost of constructing farm buildings and land clearing is out of line with general land values. If any developments do take place, a determination should be made as to the productivity of the soil. If the soil is determined to be adequately productive, areas should be settled only on a community basis so that the neighborhood will be self-sustaining.

### (2) Drainage

The supreme effort to produce the maximum amount of food during the war together with the shortage of fertilizing materials, limited labor to produce lime, etc., led to very intensive land use with resultant damage to land particularly to the steeper slopes. It is also appreciated that poor land use has always existed because much land, especially the steeper parts of it have been too intensively farmed in the past. These practices have resulted in depletion of plant food and loss of top soil by erosion. These facts make it seem logical, even imperative, to bring under cultivation an area of virgin soil. In southeastern Wisconsin the greatest reservoir of this sort is the better quality wet land.

It will require some time to develop an efficient project in the reclamation of this land. Notable limitations can be given as follows: During the years of the depression in the thirties, practically no drainage work was done. This meant that the skilled labor in that field sought other occupations. Equipment was not repaired, and some of it perhaps scrapped. Tile manufacturing plants went out of business and some were converted to other uses. It will require some time to train skilled labor, get equipment and volume of supplies before the project can be carried on at a high rate of activity. Immediate post-war two-year period ought to be used for preparation for the real development in the genuine post-war period. The estimates of man power required for laying tile were based on the use of trenching machinery. If the work were to be done by hand about three times as much labor would be required. The cost would be about fifty percent higher than if trenching machines were used.

A logical beginning would be the rehabilitation of public drains, primarily open ditches. The excavations required for these improvements will be largely machine work. Some hand labor will be required for clearing trees and brush out of ditches and along the banks. Structures for the safe entrance of flood water at points where large quantities come into the ditches would require labor for construction. Ditch maintenance has frequently been unusually high because gullies were permitted to cut wherever flood water entered them.

Next highest merit in priority would be the tiling of swales and potholes in otherwise good farms. Many farmers during normal and wet spring seasons delay the planting of grain and corn while they are waiting for the wet parts of the field to become dry enough for working through them. This means that grain seedings are frequently delayed with the result of poor yields for the entire fields, upland as well as the wet draws. Drainage of this type of wet land has high merit because it will permit earlier sowing and promote uniform ripening. Third on the list of priorities would be tile drainage of occupied farms on which the land was dry enough to justify clearing and improvement but on which the soil is too wet to give maximum results from farming. It would be definitely profitable to the farmers involved if this type of land were tiled, and it would be a national asset because it would increase the efficiency of farming.

Fourth on the list of priorities would be the margins of occupied farms. By this is meant farms on parts of which are upland but parts of which extend into large marshes. Land of this type nearly always requires organization of and the construction of public drains in order to secure outlets for the tile drainage.

Last in priority would come the larger areas of marsh land not occupied now and only a small fraction used even extensively for wild hay and wood products. In the normal course of events this would not be developed for farms for a long time for economic reasons. Upland farms generally sell for prices not much in excess of replacement cost of buildings. This means that for general farming the cost of drainage would make the investment in the farm higher than market prices of existing farms. Some moderate part of this may be developed soon for the growing of special crops.

An estimated 983,000 acres of land, most of which is now in pasture, should be developed as cropland through drainage. In the immediate two-year post-war period an estimated 6,317 acres



should be drained. This is a very conservative estimate but is kept at this figure because of the limited amount of tile which can be expected to be available. Factories have only been able to supply 300 car loads of tile per year, which would be only enough to completely tile the above-mentioned acreage.

#### Special Problems in the Various Areas

Area I: The land with definite drainage needs in this area does not exceed 1% of the total land in farms. It is generally located in narrow strips of bottom land in the valleys. It is not readily adapted to a broad land reclamation project. Some technical help could advantageously be given these farmers. Over a period of years they would undoubtedly reclaim this land providing they were given the technical help that the Soil Conservation Districts might be able to furnish.

Sauk County District and, to a lesser degree, Richland County District, have somewhat more wet land than is typical of this area as a whole. In those counties it might be worth while to organize a project somewhat similar to the type described in Areas II and III.

Area II: In this area is located the larger portion of the generally good quality wet land of the state. It is the best resource from a developmental point of view. Its location is close to markets and the locality is quite evenly settled. Transportation facilities are good. The climate is favorable and agriculture in general is well developed. An estimated 653,000 acres could be brought into crop production through drainage.

Much of the wet land recommended for drainage in this territory would come under the first four priorities listed under the heading of "General". Some of the area under the fourth priority could well be developed for the production of special crops.

Area III: This area has some wet lands that would classify under Priorities I and II. In this area there are also many large areas of level Superior clay loam and silt loam soils. They are in occupied farms generally well developed. The productivity, however, is limited by the deficient drainage. The agriculture of this land could be much improved in efficiency and in total production if tile drainage were provided. Approximately 285,000 acres could feasibly be drained in this area.



Area IV: Drainage activities in this area have given the products of drainage public disrepute because land was ditched when there was no good economic reason for doing so. The first hazard is economic, some of the marsh soils are of a poor quality. ;

The general statement can be made that the quality of the marsh soils of the eastern part of this area are fair to good with a gradual decrease in quality as you travel westward. The large areas west of the Wisconsin River are generally very poor. These are low lime peats that require for crop production, lime, potassium and phosphorus and frequently some of the minor elements. The frost hazard is rather great. For these reasons a high degree of discrimination must be used if any of these lands are developed because only very small areas are suitable. 45,000 acres of marsh land, largely in the eastern portion, could be developed by drainage.

Area V: Area of wet land in this division is rather small. It compares in quality and desirability for reclamation with the better soils of this type in Area V. The total adaptable area is not large. Major adjustments in the upland will be more feasible than large drainage enterprises.

Area VI: The Spencer soils of this area have very deficient internal drainage because of tight subsoils but they do not respond readily to under-drainage. Interest in drainage of springy seepage zones in upland is increasing particularly in Portage and Marathon counties. If the project of drainage could be adapted to this situation a great deal of work of high merit could be accomplished. Some improvement of the flat areas can be accomplished by surface drainage. This may make the land more productive for pasture and meadow but will not adapt it to more intensive crops.

Area VII: The agriculture of this area ranges from well developed farms along the southern margin like Polk and Shawano counties to very slight agricultural development in Vilas and Forest counties. Peat soils of this area present a serious frost hazard and very little if any ought to be drained for use in general farming. Small areas have been developed for growing special crops like head lettuce but this need is not great. Desirable drainage enterprises will be the swales and low spots that cut up otherwise good fields. Many such situations occur in southeastern Shawano county for example. Perhaps there is enough need for drainage in Oconto, Shawano, Polk and perhaps a few other counties to merit a drainage project. It certainly does not have general application in the area.

### (3) Farm Structures and Improvements

The changes recommended in drainage and other phases of land use are not likely to require any material large-scale building program. Houses, barns and other buildings will need to be enlarged in some cases, in other cases present buildings are unserviceable and will need replacement, but these should be made by the farmer. Existing financing facilities no doubt are adequate for the needed building program.

### (4) Purchase of Submarginal Crop and Pasture Land

The recommendations for the purchase of submarginal crop and pasture land in the several areas in the state have been confined to the following specific cases:

Isolated settlers living within the zoned portions of counties in the northern portion of the state.

Extensive areas of light sandy or stony lands lying within Areas I, II and VI.

The purchase of recreational lands within Area II.

The purchase of lands generally classified under "Capability VII" within Area I but which will contain small areas of lands of a much higher capability.

#### Area I

Because of steep slopes, rapid run-off and the large amount of erosion which has taken place in the past, all available information indicates that there are approximately 500,000 acres in this area submarginal for agricultural use which should be permanently retired from the production of cultivated crops and devoted to the production of pasture and timber.

Available information indicates that about 50% of this submarginal area is in units large enough to require some kind of public ownership. The remainder of it is either located on individual farms or is in such small units that public ownership and administration would be impractical.

Land values are relatively high and it is estimated that the total cost of acquiring the 250,000 acres would be approximately \$3,375,000. Acquisition costs should run slightly under 10% - probably not exceeding \$350,000, making a grand total for land acquisition of \$3,725,000.

As in the case of other lands to be publicly acquired, the first year would be required to make plans and to secure ownership of sufficient land to make the initiation of a development program possible during the second year after the cessation of hostilities. The land acquisition budget for the first year should provide \$350,000 for the acquisition of 25,000 acres. The second year an equal amount should be provided for land acquisition.

If the acquisition program is successful the development of the area suitable for pasture and timber could be initiated during the second year. It is estimated that 40% of the lands to be acquired would be suitable for the production of pasture crops; that is, they would be in large enough areas to justify fencing and the establishment of water supplies to permit the sale of available pasture to private operators. The remaining 60% of the area is suitable only for the production of trees.

Assuming initiation of development on 5,000 acres of pasture during the second year, needs would be somewhat as follows:

Limestone:

Two tons per acre. 10,000 tons.

Fertilizer:

250 pounds per acre. 625 tons.

Fencing:

An indefinite amount of fencing depending upon the size of units in which it is possible to develop the pasture areas. All post material to be manufactured from wooded areas on lands acquired.

Trees:

5,000. 3,000 Conifers and 2,000 Hardwoods

Equipment:

Dump trucks - 2-ton - 10. Cargo trucks - 1-1/2 to 2-ton - 6. Tractors, discs and drills for pasture development. Three tractor and plow outfits for furrowing for reforestation, 700 planting bars. Miscellaneous hand tools, axes, shovels, saws, etc.

Average Cost of Development Less Technical Help:

Pasture development - 5,000 acres at \$12.00 to \$15.00 an acre - \$67,500. Reforestation at \$8.00 an acre (including furrowing) \$40,000 - a total of \$107,500.

Area II

An area of highly developed productive agricultural soils which, in the main, contains only small areas submarginal for the production of agricultural crops or pasture. It is felt that with one exception, the Kettle Moraine area in which the state has recommended the purchase of approximately 33,000 acres for the establishment of a recreational area, none of the other submarginal areas are large enough to justify federal purchase but should be handled by individual farmers or local committees. Specific recommendations on the purchase and development of the Kettle Moraine area should be handled by another subcommittee. No recommendation will be made here for that area.

Area III

The submarginal crop and pasture land in this area occurs in relatively small tracts usually occupying only a portion of a farm. It is not felt that any of these submarginal areas are large enough to warrant consideration for a public purchase program.

Area IV

This sandy area contains a considerable acreage of submarginal land in farms which it is felt presents too large a problem for private capital to handle. This area of land comprising approximately 150,000 acres should be permanently retired from agricultural use.

In addition to this purchase program, there are within that area 249 non-conforming users within the zoned portions of the counties. Specific recommendations for the acquisition of the holdings of these isolated settlers will be incorporated in the recommendations for purchase under Area VII as it is impractical to attempt to separate the purchase program which should be carried on with these individuals into the several areas in which they are located.

The 150,000 acres on which specific acquisition is recommended consist primarily of light sandy soils, low in organic matter, subject to excessive drouth injury and location of which is in a section of the state where crops are subject to damage from both late spring and early fall



frosts. Due to these factors, the economic situation of the families occupying these lands is extremely precarious under normal conditions. The standards of living are low. Many of the families are often isolated from neighbors and the cost of maintaining roads, schools, and other governmental functions within the area in which they live are abnormally high.

Based on the capabilities of these lands, they should be retired permanently from agricultural use and devoted exclusively to the production of forest and wildlife crops. In initiating a plan for the acquisition and development of these lands for that purpose, the work plan for each of the two years following cessation of hostilities should be as follows:

The first two years will be consumed in acquiring sufficient interest in a portion of the acreage recommended for purchase to permit the initiation of a work program the third year. Based on the assumption that a minimum of 50% of the acreage acquired would require reforestation, the work program for the third year would be somewhat as follows:

Material:

37,500,000 2-1 transplants of White, Norway and Jack Pine divided approximately as follows: 50% Jack; 25% White and 25% Norway.

Labor:

37,500 man days of labor at 50¢ an hour - \$150,000.

Site Preparation:

\$1.00 per acre. Total, \$37,500.

Equipment:

250 each planting bars and carrying trays; 10 each tractors and 14" single-bottom plows for furrowing areas to be planted; 15 1-1/2 to 2-ton trucks for the transportation of men, material and equipment; 6 pick-ups, miscellaneous hand tools, gas, oil, and grease, etc.

Average Cost of Development:

For the type of soils to be acquired, it is estimated that an average cost of \$6.00 per acre would be incurred plus 15% for acquisition costs, a total of \$1,035,000.

Area V

Within this area of western rolling sand, it is estimated that there are a total of 54,000 acres of land now in farms which should be permanently retired from agricultural use. Approximately 15,000 acres of this area located in western



Eau Claire and southeastern Dunn counties would be suitable for the development of a grazing area. The remainder of this acreage -- approximately 39,000 acres -- is scattered throughout existing wooded areas and this development should be handled in conjunction with them as a portion of the forestry report.

In addition, there are 93 non-conforming users living within the zoned portions of the counties which have enacted zoning ordinances. The handling of these cases will be discussed under Area VII.

The area suitable for pasture development is a level to undulating sandy plain not now subject to extensive agricultural use, apparently being used only periodically largely by speculators. The soil at one time contained a fair amount of organic matter but due to continued cropping, that supply has become depleted.

The first year, any program initiated toward the acquisition and development of this area would be consumed in obtaining title to a sufficient acreage of the land to permit the actual initiation of development work during the second year.

On the assumption that a sufficient acreage could be acquired, the initiation of development work on 5,000 acres the second year is the maximum amount that should be undertaken.

Materials required for the development of a unit of that size are estimated to be as follows:

Limestone: Two tons an acre - 10,000 tons.

Fertilizer: 300 to 500 pounds an acre. 750 to 1,250 tons.

Fencing Materials: Tractors; heavy discs; drills; miscellaneous hand tools; dump trucks (2-ton) 10; cargo trucks (1-1/2 to 2-ton) 5.

Average Cost of Development:

\$10.00 to \$15.00 an acre. The cost of development on this land could run much higher depending upon the difficulty of obtaining adequate water for pastures, cost of seed and the size of pasture units into which it is divided. No estimate of the amount of fencing required can be made without physical inspection of the area.

Estimated Cost of the Land:

\$10.00 an acre plus 15% for overhead and acquisition costs -  
\$611,000.

Area VI

Based upon the land capabilities and other information available, it has been estimated that 8-1/2% or 225,000 acres of this area now in farms is submarginal for agricultural use and should be permanently retired. In addition, there are 216 non-conforming users living within the zoned portions of the counties in this area which have enacted zoning ordinances. The purchase of the holdings of these settlers will be covered in Area VII.

While the soils of this area as a whole are generally suited to the production of agricultural crops, there are a good many places in which lack of drainage or the extreme stoniness of the soil makes their use for that purpose impractical. In areas of that character the farms are, as a rule, small and widely scattered - many forty-acre tracts having been acquired from lumber companies and railroads, or the land companies organized by them to dispose of their holdings once the timber had been removed.

The economic status of the families is precarious and the majority of them have too small an area of cleared land to provide sufficient cropped and hay land. In the majority of cases there is no additional land suitable for clearing on the tracts which they have acquired or have under purchase contract. In most instances, the lands were acquired at too high a price per acre. With the comparative low productivity of the soils, the acquisition of additional lands and their clearing and development for agricultural purposes is not practical. The cost of maintaining roads, schools and other governmental facilities for these families is excessive because of their scattered nature.

Due to the fact that a good many of the holdings which should be acquired have been purchased on contract from land and lumber companies which have, in the main, had their land values excessively high, it is impossible to accurately estimate the cost of acquiring the acreage of land which should be retired in this area.

It is expected that the cost of acquiring the land now in farms which should be retired from agricultural use will run between \$12.00 and \$15.00 an acre including the cost of acquisition. Due to the scattered nature of these lands through existing brush and forest areas, no development program is recommended at this time as it is felt that the acreage will be included within

estimates prepared by some of the other subcommittees.

#### Area VII

Primarily, a forest area in which the major portion of the problem will no doubt be covered by the report of the subcommittee dealing with forest lands. There are, however, within this area, plus that within Areas IV, V, and VI, a total of 1,619 non-conforming users living within the boundaries of the restricted areas established by zoning ordinances of the several counties. Based on the experience encountered in the Isolated Settler Purchase Program which has been carried on in Wisconsin for several years, it is estimated that a total of 970 of these holdings will eventually have to be acquired to make the zoning ordinances fully effective and to assist the counties in reducing the cost of maintaining roads, schools and other government costs within the zoned areas.

These non-conforming users, although often located on small patches of good agricultural land are usually isolated from neighbors, schools, towns and other facilities. The majority of them are in poor economic condition due either to lack of sufficient cropland and extreme isolation which increases their cost of marketing, or to their inability to obtain outside employment from which to derive a satisfactory income.

The purchase of the holdings of these individuals and their relocation on farms in existing agricultural areas will not only affect a saving to the counties through enabling them to close schools and discontinue winter maintenance on roads, but will permit them to administer the necessary direct relief cases more economically.

No work program is recommended for the lands thus acquired as they are without exception located in forest areas where the development of the holdings will be covered by the recommendations of the subcommittee dealing with those lands.

The acquisition of the holdings involved should proceed in an orderly manner. No attempt should be made for a large acquisition program during any one year. It is recommended that sufficient funds be made available for each of the two years following cessation of hostilities and for each year thereafter until all of the holdings have been acquired to provide for the purchase of an average of 100 cases each year.

Based on the costs encountered in the acquisition of the cases already acquired, an average of \$1000 per holding will be necessary plus 20% for acquisition costs. The acquisition costs on these tracts are abnormally high because of their scattered nature and the excessive amount of travel time and field work required.

The present authorization for the acquisition of lands of this character contained in Title III of the Bankhead-Jones Farm Tenant Act is limited to the acquisition of lands outside the boundaries of national forests. A good many of the families included in this category live within the national forests. Authorization to include the purchase of the holdings of these families should be included in any acquisition program initiated.

### Other Measures Needed

Desirable goals for improving the pattern of land use, for reasonable applications of lime and fertilizer, for bringing about more desirable rotations and better pastures, for establishing mechanical soil conservation practices, etc., have been set up in this report but it is definitely questionable whether they can anywhere near be attained by virtue of the human factor involved.

In order to bring about a greater recognition of the state of soil depletion and misuse and to create a desire on the part of farmers to adopt programs involving the proposed changes and developments which will contribute to improved land use and long-time soil stability, an intensive educational program will definitely be required. The Extension Service has done a highly commendable job in this field but it is questionable if, with their present staffs, they could change the ideas and attitudes of farmers to the point where they would want to, in any two-year period, do all the jobs proposed. If a public aid program is set up many farmers may take advantage of it for the sake of getting something for nothing rather than to accept the program on the basis of the contribution it will make to better land use and to the conservation of soil resources. If improvements that are made are to be of a permanent nature, it will be necessary that the farmers be sold on them, otherwise, whatever public aid is provided will have only a temporary effect. It is our proposal that the funds for the Extension Service be supplemented to the degree that they will be in a position to provide adequate educational assistance so that whatever public land use programs are undertaken will be of a highly constructive and permanent nature.

It has been definitely proven in soil conservation demonstration areas and in Soil Conservation Districts that conservation plans for individual farms have paid off real dividends. It has been shown that farmers have not only been able to conserve their soil and improve fertility but they have been able to increase agricultural output as a result of these programs.



It is proposed that 21,217 plans be developed during the two-year period succeeding the close of the European war. This figure is above normal expectancy but in the event a concerted drive is made in the educational field, it is possible that this goal can be attained. Likewise, it will be necessary that an intensive training program be put on to train a staff of farm planners who can adequately handle such a volume of business. It must also be remembered in this connection that in addition to assisting in the development of plans there is the proposition of giving service in their layout and that there still will be several thousand plans now in existence which will need servicing. Many of these older plans may require modification because of changing conditions.

As a basis for farm planning, soil conservation surveys are essential. This program should be carried on to completion as rapidly as possible.

Major emphasis to the completion of the survey program and the development of farm plans should be channeled through Soil Conservation Districts. As has previously been indicated, Soil Conservation Districts are organized pursuant to state law and the local District Supervisors have shown able leadership in conducting programs of this type.

In closing, we should like to again reiterate that this report was prepared on the premise that it was to indicate what should be done, as a start, to maintain our soils in a productive state and furthermore, that we have indicated only to a very minor degree how this job is to be done. If possible, it is hoped that there will be no unemployment after the European war and that the wheels of industry and agriculture can keep turning at a high rate which will thereby be mutually beneficial to everyone. However, even the most optimistic are skeptical whether such a condition will exist and far be it from us to suggest how any public works program can be set up to best carry out and facilitate the jobs to be done. Soil Conservation District Supervisors have indicated that public aid be kept at an absolute minimum and that programs be localized and administered through established local governmental units. It is our belief that Soil Conservation Districts present an excellent medium for carrying out work in the field of "land and pasture development".

| ACTIVITY                                   | ACRES TREATED |               | TREATMENT RATE                                | QUANTITY   |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS   |     |                       |             |                   |                       |               |                 |         |           |
|--|---------------|---------------|---|------------|---------------|--------|--------|------|--------|------------------------------|-----|-----------------------|-------------|-------------------|-----------------------|---------------|-----------------|---------|-----------|
|  | Total         | 2 year period | Based on Acreage                              | Total      | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT              |     |                       |             | MATERIAL AND FUEL |                       |               | LABOR MAN-MONTH |         |           |
|  |               |               |   |            |               |        |        |      |        | Kind                         | No. | Unit Production       | Months      | Kind              | Unit Consumption rate | Amount        | Tech.           | skilled | unskilled |
| LIME PRODUCTION                            |               |               |   | Tons       |               |        |        |      |        | Jaw Crusher                  | 1   |                       | 478         |                   |                       |               |                 |         |           |
| Cropland                                   | 6,415,000     | 1,283,000     | 2yr 1/2 initial appl.                         | 16,849,000 | 3,269,800     | +      | +      | +    | ++     | Hammer Mill                  | 1   | 100,000               | 478         | Dynamite          | 1/3 #/Ton             | 664 Tons      |                 |         |           |
| Pasture land                               | 2,756,000     | 275,670       | 2yr 1/2 initial appl.                         | 7,169,000  | 916,940       | +      | +      | +    | ++     | Stationary Motor             | 1   | Tons                  | 478         |                   |                       |               |                 |         |           |
|  |               |               |   |            |               |        |        |      |        | Belt Conveyor                | 3   | per year              | 1434        |                   |                       |               |                 |         |           |
|  |               |               |   |            |               |        |        |      |        | No. 8 per                    | 1   |                       | 478         |                   |                       |               |                 |         |           |
|  |               |               |   |            |               |        |        |      |        | Air Compressor               | 1   |                       | 478         | Fuel              | 3/4 gal/Ton           | 2990,035 gal  |                 |         |           |
| Total                                      | 9,171,000     | 1,558,670     |   | 23,518,000 | 3,986,740     |        |        |      |        | Power shovel                 | 1   |                       | 478         |                   |                       |               | 1641            | 3337    |           |
|  |               |               |   |            |               |        |        |      |        | 4x Trucks                    | 10  |                       | 4780        |                   |                       |               |                 |         |           |
| FERTILLIZING                               |               |               |   | Tons       |               |        |        |      |        | 10' grain drill with         | 1   | 200A per year         | 10881 Units |                   |                       |               |                 |         |           |
| Cropland                                   |               | 3,874,000     | 100#/A/year rotation                          |            | 886,500       | ++     | -      | -    | -      | for 19 gross seed attachment |     |                       |             |                   |                       |               |                 |         |           |
| Pasture land                               | 2,900,000     | 580,600       | 400#/A/10 years                               |            | 126,000       | ++     | -      | -    | -      |                              |     |                       |             |                   |                       |               |                 |         |           |
| Total                                      | 2,900,000     | 4,454,600     |   |            | 1,012,500     |        |        |      |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| SEEDING                                    |               |               |   |            |               |        |        |      |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| Cropland                                   |               | 5,010,000     |   |            |               | ++     | -      | -    | -      |                              |     |                       |             |                   |                       |               |                 |         |           |
| Pasture land                               | 3,192,100     | 424,570       |   |            |               | ++     | -      | -    | -      |                              |     |                       |             |                   |                       |               |                 |         |           |
| Total                                      | 3,192,100     | 4,434,570     |   |            |               |        |        |      |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| TERRACING                                  | 964,000       | 96,400        | 1 Mile Terrace/A                              | 96,400     | 9,640         | +      | -      | +    | -      | Farm Tractor w/plow          | 1   | 1/2 Total Miles       |             |                   |                       |               |                 |         |           |
|  |               |               |   |            |               |        |        |      |        | Motorized Grader             | 1   | 1500/da               | 81          | Fuel              | 15 gal/day            | 24,300 gal    | 964             | 81      | 76        |
| NEW FENCE                                  |               |               | 160 rds/Farm                                  |            | 10,670        | +      | +      | +    |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| Fence removal                              |               |               | 120 rds/Farm                                  |            | 7963          | +      | +      | +    |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| Stone Fence removal                        |               |               |   | 2650       | 265           |        |        |      |        | Power shovel                 | 1   | 777/Mod M             | 38          |                   |                       |               |                 |         |           |
| Total                                      |               |               |   |            | 18,898        |        |        |      |        | Bulldozer                    | 1   |                       | 38          | Fuel              |                       | 38,000 gal    |                 | 76      | 114       |
| EROSION CONTROL                            |               |               | Unit: 200A Watershed                          | No.        |               |        |        |      |        | 1 bag Conc. Mixer            | 1   |                       | 477         | Cement            | 1 1/2 bbl per C.Y.    | 71,370 bbls   |                 |         |           |
| STRUCTURES                                 | 2,142,300     | 2,142,430     | 4x4' drop in lot                              |            |               |        |        |      |        | and Power shovel             | 1   | 20                    | 477         | Sand              | 1/2 C.Y.              | 23,790 CY     |                 |         |           |
| LARGE                                      |               |               | 20' Head                                      | 7930       | 793           |        |        |      |        | Tractor w/bulldozer          | 1   | Structure             | 477         | Gravel            | 1 CY                  | 47,580 CY     |                 |         |           |
| Reinf. Conc. Const.                        |               |               | 60 CY Concrete                                |            |               | +      | +      | +    | -      | Tractor                      | 1   | per year              | 477         | Steel             | 100#                  | 2379 Tons     |                 |         |           |
|  |               |               | 5000 CY Earth                                 |            |               |        |        |      |        | Rotary scraper               | 1   | year                  | 477         | Lumber            | 50 bbl/y              | 2379 Tons     | 326             | 1210    | 3633      |
| EROSION CONTROL                            |               |               | Unit: 2' x 12' Masonry                        | No.        |               |        |        |      |        |                              |     |                       |             | Earth             | 5000 CY/1/3 mi        | 3,965,000 CY  | 1541            | 2245    | 1123      |
| STRUCTURES                                 | 2,142,300     | 2,142,430     | Notch S.H.                                    |            |               |        |        |      |        | 1/2 bag Conc. Mixer          | 10  | 40                    | 4920        | Cement            | 1 1/2 bbl per C.Y.    | 4,912 bbls    |                 |         |           |
| SMALL                                      |               |               | 70 CY Masonry                                 | 16,500     | 1650          | +      | +      | +    | +      | Tractor w/bulldozer          | 1   | structure             | 492         | Sand              | 1/2 C.Y.              | 9,625 CY      | 495             | 5770    | 5770      |
| Masonry Const.                             |               |               | 300 CY Earth                                  |            |               |        |        |      |        | Rotary scraper               | 1   | per year              | 492         | Rock              | 1 CY                  | 115,500 CY    | 122             | 206     | 1241      |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Earth             | 500 CY/1/3 mi         | 495,000 CY    | 22              | 100     | 396       |
| Living Snow Fence and Shelterbelt Planting |               |               | Three rows trees 6' x 1/4 mile per farm       | 195,490    | 19,549        | ++     | -      | -    | -      | Tree planter                 | 1   | 50 ft. per Mach. Mon. | 392         | Trees             | 2640 T/1/4 mile       | 19,008 T/1/4  | 2               | 18      | 784       |
| CONTOUR STRIP CROPPING                     | 3,097,300     | 309,730       |   | 3,097,300  | 309,730       | +      | -      | +    | -      |                              |     |                       |             |                   |                       |               | 1236            | 1236    |           |
| WIND STRIP CROPPING                        | 604,800       | 60,480        |   | 604,800    | 60,480        | +      | -      | +    | -      |                              |     |                       |             |                   |                       |               | 121             | 121     |           |
| SURVEYS & PLANS                            |               |               |   | Man-months |               |        |        |      |        |                              |     |                       |             |                   |                       |               |                 |         |           |
| Conservation Surveys                       | 17,058,335    | 3,410,000     | 8.05/A detail sur.                            |            | 337           | +      | +      | +    | -      |                              |     |                       |             |                   |                       |               | 337             |         |           |
| Individual Farm Plans                      |               |               | 8.007/A util. sur.                            |            |               | +      | +      | +    | +      |                              |     |                       |             |                   |                       |               |                 |         |           |
| Flood Control Surveys                      |               |               | 100 plans/4 unit/year                         |            | 21,217        | +      | +      | +    | +      |                              |     |                       |             |                   |                       |               | 2538            | 2538    | 2538      |
| DRAINAGE                                   |               |               |   |            |               |        |        |      |        |                              |     |                       |             |                   |                       |               | 72              | 27      |           |
| Maintenance Public Ditches                 | 697,000       | 285,400       |   | 1544       | 749           | +      | +      | +    | -      | 3/4 yd dragline              | 1   | 10 miles per year     | 838         | Fuel              |                       | 838,000 gal   | 209             | 838     | 1675      |
| Community Ditches                          | 491,500       | 178,500       | 20' per Acre                                  | 1865       | 685           | +      | +      | +    | -      | 3/4 yd dragline              | 1   | 5 miles per year      | 1644        | Fuel              |                       | 1,460,400 gal | 411             | 1644    | 3288      |
| Bridge                                     | 491,500       | 178,500       | 16 bridge/mile open ditch                     | 1865       | 685           | +      | +      | +    | +      | 1609 conc mixer              | 1   | 5 C.Y./day            | 176         | Cement            | 1 1/2 bbl per C.Y.    | 30,825 bbls   |                 |         |           |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Sand              | 1/2 C.Y.              | 10,275 CY     |                 |         |           |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Gravel            | 1 CY                  | 20,550 CY     | 114             | 343     | 4116      |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Steel             | 100#                  | 1,027 Tons    |                 |         |           |
| Flood Water Intake                         | 983,000       | 6317          | 1 structure per 80A 5 cy. conc. per structure | 12,367     | 99            | +      | +      | +    |        | 1609 conc mixer              | 1   | 5 C.Y./day            | 5           | Cement            | 1 1/2 bbl             | 592 bbls      | 6               | 24      | 48        |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Sand              | 1/2 C.Y.              | 197 CY        |                 |         |           |
|  |               |               |   |            |               |        |        |      |        |                              |     |                       |             | Gravel            | 1 CY                  | 395 CY        |                 |         |           |
| Outlet Tile                                | 983,000       | 7925          | 40' per Acre                                  | 7450       | 60            | +      | +      | +    | -      | Trencher                     | 1   | 100,000' per year     | 38          | 10" Tile          | 100/gal               | 3158 gal      | 8               | 16      | 16        |
| Lateral Tile                               | 983,000       | 6317          | 450' per Acre                                 | 84,440     | 540           | +      | +      | +    | -      | Trencher                     | 1   | 100,000' per year     | 341         | 5" Tile           | 100/gal               | 28,525 gal    | 63              | 151     | 151       |
| GRAND TOTAL                                |               |               |   |            |               |        |        |      |        |                              |     |                       |             |                   |                       |               | 8587            | 18285   | 28306     |





AREA I

TABLE 7 *Dr. A. J. W.*

| ACTIVITY                                   | ACRES TREATED |             | TREATMENT RATE            | QUANTITY  |             | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS                  |    |                 |                   |          |                       |                 |       |         |           |  |  |
|--|---------------|-------------|---------------------------|-----------|-------------|--------|--------|------|--------|---|----|-----------------|-------------------|----------|-----------------------|-----------------|-------|---------|-----------|--|--|
|  | Total         | 2yr. period | Based on Acreage          | Total     | 2yr. period | spring | Summer | Fall | Winter | MAJOR EQUIPEMENT                            |    |                 | MATERIAL AND FUEL |          |                       | LABOR MAN-MONTH |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Kind  | No | Unit Production | Mach. Months      | Kind     | Unit Consumption Rate | Amount          | Tech. | Skilled | Unskilled |  |  |
| LIME PRODUCTION                            |               |             | initial application       | Tons      | Tons        |        |        |      |        | Jaw Crusher                                 | 1  |                 | 120               |          |                       |                 |       |         |           |  |  |
| Cropland                                   | 1,605,000     | 321,000     | 2 1/2 Tons/A              | 4,013,000 | 802,600     | +      | +      | +    | ++     | Hammer Mill                                 | 1  | 100,000         |                   | Dynamite | 1/3*/Ton              | 167 Tons        |       |         |           |  |  |
| Pasture land                               | 1,016,000     | 101,600     | 2yr. 1/5 initial applie.  | 2,020,500 | 202,050     | +      | +      | +    | ++     | Stationary Motor                            | 1  | Tons            |                   |          |                       |                 |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Belt Conveyor                               | 3  | Per year        |                   |          |                       |                 |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Hopper                                      | 1  |                 |                   |          |                       |                 |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Air Compressor w/hammer                     | 1  |                 |                   | Fuel     | 3/490/Ton             | 750,000 Gal     |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Power shovel                                | 1  |                 |                   |          |                       |                 |       |         |           |  |  |
| Total                                      | 2,621,000     | 422,600     |                           | 6,033,500 | 1,004,650   |        |        |      |        | 4-ton Truck                                 | 10 |                 |                   |          |                       |                 | 412   | 838     |           |  |  |
| FERTILLIZING                               |               |             |                           |           | Tons        |        |        |      |        | 10' grain drill with fert. & grass. attach. |    | 200A/yr         | 2950 units        |          |                       |                 |       |         |           |  |  |
| Cropland                                   |               | 886,000     | 100#/A/year rotation      |           | 177,000     | ++     | -      | -    | -      |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Pasture land                               |               | 214,000     | 400#/A/10 years           |           | 43,000      | ++     | -      | -    | -      |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Total                                      |               | 1,100,000   |                           |           | 220,000     |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| SEEDING                                    |               |             |                           |           |             |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Cropland                                   |               | 984,000     |                           |           |             | 1+     | -      | -    | -      |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Pasture land                               | 1,098,500     | 134,300     |                           |           |             | ++     | -      | -    | -      |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Total                                      |               | 1,128,300   |                           |           |             |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| TERRACING                                  | 215,000       | 21,500      | 1/4 mile Terrace/A        | 21,500 M. | 2,150 M     | +      | -      | +    | -      | Form Tractor w/Plow                         |    | 1/2 Total M./cs |                   |          |                       |                 |       |         |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Motorized Grader                            |    | 1500/day        | 15                | Fuel     | 15 gal/day            | 4,500 Gal       | 215   | 15      |           |  |  |
| NEW FENCE                                  |               |             | 160 rds / Farm            |           | 2479 Mks    |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Fence removal                              |               |             | 120 rds / Farm            |           | 1860 Mks    |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Stone Fence Removal                        |               |             |                           |           |             |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Total                                      |               |             |                           |           | 4339 M      |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| EROSION CONTROL                            |               |             | Unit: 200 A Watershed     |           |             |        |        |      |        | 1 bag Conc. Mixer                           | 1  |                 | 220               | Cement   | 1 1/2 bbls per CY     | 32,940 bbls     |       |         |           |  |  |
| STRUCTURES                                 |               |             | 4'x4' drop inlet 20'h.    |           |             |        |        |      |        | 1/2 yd Power shovel                         | 1  | 20              | 220               | Sand     | 1/2 CY "              | 10,980 CY       |       |         |           |  |  |
| LARGE                                      | 4,793,500     | 479,350     | 60 CY Concrete            | 3660 No.  | 366 No.     | +      | +      | +    | -      | Tractor w/bulldozer                         | 1  | structures      | 220               | Gravel   | 1 CY "                | 21,960 CY       |       |         |           |  |  |
| Reinf. Conc. Const.                        |               |             | 5000 CY Earth fill        |           |             |        |        |      |        | Tractor                                     | 1  | per             | 220               | Steel    | 100' "                | 1098 Tons       | 148   | 549     |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | Rotary scraper                              | 1  | year            | 220               | Lumber   | 506 ft                | 1098 MWH        | 296   | 1000    |           |  |  |
| EROSION CONTROL                            |               |             | Unit: 2 1/2' Masonry      |           |             |        |        |      |        |   |    |                 |                   | Earth    | 5000 CY/strct         | 1830,000 CY     |       |         |           |  |  |
| STRUCTURES                                 |               |             | Notch 5'h.                |           |             |        |        |      |        |   |    |                 |                   | Masonry  |                       |                 |       |         |           |  |  |
| SMALL                                      | 4,793,500     | 479,350     | 70 CY Masonry             | 8,000 No  | 800 No      | +      | +      | +    | +      | 1 bag Conc Mixer                            | 10 | 40              | 2400              | Cement   | 1/2 bbl /CY Mas       | 2,300 bbls      |       |         |           |  |  |
| Masonry Const.                             |               |             | 300 CY Earth fill         |           |             |        |        |      |        | Tractor w/bulldozer                         | 1  | structures      | 240               | Sand     | 1/2 CY "              | 4,600 CY        | 240   | 2800    |           |  |  |
|  |               |             |                           |           |             |        |        |      |        | 1 rotary scraper                            | 1  | per year        | 240               | Rock     | 1 CY "                | 56,000 CY       | 60    | 100     |           |  |  |
|  |               |             |                           |           |             |        |        |      |        |   |    |                 |                   | Earth    | 300 CY/strct          | 240,000 CY      | 10    | 48      |           |  |  |
| Living Snow Fence and Shelterbelt Planting |               |             | Three rows trees 6' x 16' | 10,000 M. | 1,000 M     | ++     | -      | -    | -      | Tree planter                                | 1  | 50 M/1700 M.    | 20                | Trees    | 2640 M/1/4 mile       | 2640 M.T.       | 1     | 40      |           |  |  |
| CONTOUR STRIP CROPPING                     | 856,000       | 85,600      | 1/4 mile / farm           | 856,000 A | 85,600 A    | +      | -      | +    | -      |   |    |                 |                   |          |                       |                 | 342   | 342     |           |  |  |
| WIND STRIP CROPPING                        | 57,800        | 5,780       |                           | 57,800 A  | 5,780 A     | +      | -      | +    | -      |   |    |                 |                   |          |                       |                 | 11    | 11      |           |  |  |
| SURVEYS & PLANS                            |               |             | 1/25/A detail             | 1700      | 1700        |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |
| Conservation Surveys                       | 1,842,793     | 368,554     | 1/8007/A utilit. sur.     | 216       | 43          | +      | +      | +    | -      |   |    |                 |                   |          |                       |                 | 43    |         |           |  |  |
| Individual Farm Plans                      |               |             | 100 plans/unit/yr.        |           | 4959 No.    | +      | +      | +    | +      |   |    |                 |                   |          |                       |                 | 593   | 593     |           |  |  |
| Flood Control Surveys                      |               |             |                           |           |             | +      | +      | +    | +      |   |    |                 |                   |          |                       |                 | 44    | 15      |           |  |  |
| GRAND TOTAL                                |               |             |                           |           |             |        |        |      |        |   |    |                 |                   |          |                       |                 |       |         |           |  |  |





| ACTIVITY  | ACRES TREATED |               | TREATMENT RATE  | QUANTITY                                 |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS                               |     |                               |                   |          |                       |                 |      |         |           |
|---|---------------|---------------|---|--|---------------|--------|--------|------|--------|--|-----|-------------------------------|-------------------|----------|-----------------------|-----------------|------|---------|-----------|
|   | Total         | 2 year period | Based on Acreage  | Total                                    | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT  |     |                               | MATERIAL AND FUEL |          |                       | LABOR MAN-MONTH |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Kind   | No. | Unit Production               | Machine Months    | Kind     | Unit Consumption rate | Amount          | Tech | skilled | unskilled |
| LIME PRODUCTION   |               |               | initial application<br>2 Tons / A   | Tons                                     |               |        |        |      |        | Jaw Crusher  | 1   |                               | 13                |          |                       |                 |      |         |           |
| Cropland  | 2,127,000     | 425,400       | 2yr 1/2 initial applic.   | 4,254,000                                | 850,800       | +      | +      | +    | ++     | Hammer Mill  | 1   | 100,000                       | 113               | Dynamite | 1 1/2 / Ton           | 158 Tons        |      |         |           |
| Pasture land  | 471,500       | 47,150        | 2yr 1/2 initial applic.   | 943,000                                  | 94,200        | +      | +      | +    | ++     | Stationary Motor   | 1   | Tons                          | 113               |          |                       |                 |      |         |           |
| Total   | 2,598,500     | 472,550       |   | 5,196,000                                | 945,000       |        |        |      |        | 30" Conveyor   | 3   | Per year                      | 337               |          |                       |                 |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Hopper   | 1   |                               | 113               |          |                       |                 |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Air Compressor   | 1   |                               | 113               | Fuel     | 3/4 gal / Ton         | 708,700 Gal.    |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Power shovel   | 1   |                               | 113               |          |                       |                 |      |         |           |
|   |               |               |   |  |               |        |        |      |        | 45 Trucks  | 10  |                               | 1130              |          |                       |                 | 389  | 792     |           |
| FERTILLIZING  |               |               | 100 1/2 A / year rotation   | Tons                                     |               |        |        |      |        | 10' grain drill with<br>fert. & grass seed<br>attachment |     | 200 A<br>Per<br>year          | 3524 Units        |          |                       |                 |      |         |           |
| Cropland  |               | 1,362,000     |   |  | 340,500       | ++     | -      | -    | -      |  |     |                               |                   |          |                       |                 |      |         |           |
| Pasture land  |               | 142,600       | 400 1/2 A / 10 years  |  | 30,000        | ++     | -      | -    | -      |  |     |                               |                   |          |                       |                 |      |         |           |
| Total   |               | 1,511,600     |   |  | 370,500       |        |        |      |        |  |     |                               |                   |          |                       |                 |      |         |           |
| SEEDING   |               |               |   |  |               |        |        |      |        |  |     |                               |                   |          |                       |                 |      |         |           |
| Cropland  |               | 1,702,000     |   |  |               | ++     | -      | -    | -      |  |     |                               |                   |          |                       |                 |      |         |           |
| Pasture land  | 643,000       | 95,000        |   |  |               | ++     | -      | -    | -      |  |     |                               |                   |          |                       |                 |      |         |           |
| Total   |               | 1,797,000     |   |  |               |        |        |      |        |  |     |                               |                   |          |                       |                 |      |         |           |
| TERRACING   | 425,000       | 42,500        | 1 mile Terrace / A  | 42,500 <sup>1</sup> / <sub>2</sub> Miles | 4250          | +      | -      | +    | -      | Farm Tractor w/Blow<br>Materialized Grader               | 1   | 1/2 Total Miles<br>1500 / day | 30                | Fuel     | 1590 1/2 / day        | 9,000 Gal       | 425  | 30      | 30        |
| NEW FENCE   |               |               | 160 vds / Farm  | 160 1/2 Miles                            | 3511          | +      | +      | +    |        |  |     |                               |                   |          |                       |                 |      |         |           |
| Fence removal   |               |               | 120 vds / Farm  | 120 1/2 Miles                            | 2633          | +      | +      | +    |        |  |     |                               |                   |          |                       |                 |      |         |           |
| Stone Fence Removal   |               |               |   | 2650 <sup>1</sup> / <sub>2</sub> Miles   | 265           |        |        |      |        | Power shovel   | 1   | 77 1/2 / Mon                  | 38                |          |                       |                 |      |         |           |
| Total   |               |               |   |  |               |        |        |      |        | Bulldozer  | 1   |                               | 38                | Fuel     |                       | 38,000 Gal      |      | 76      | 114       |
| EROSION CONTROL<br>STRUCTURES<br>LARGE<br>Reinf. Conc. Const. | 5783,600      | 578,360       | Unit: 200 A Watershed<br>4x4' drop inlet 20' H.<br>60 CY Concrete<br>5000 CY Earth fill | 2150 No                                  | 215 No        | +      | +      | +    | -      | 1 bag Conc. Mixer  | 1   | 20                            | 129               | Cement   | 1 1/2 bbls per CY     | 19350 bbls      |      |         |           |
|   |               |               |   |  |               |        |        |      |        | 1/2 yd Power Shovel                                      | 1   | structures                    | 129               | Sand     | 1/2 CY                | 6,450 CY        |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Tractor w/bulldozer                                      | 1   | per year                      | 129               | Gravel   | 1 CY                  | 12,900 CY       |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Tractor  | 1   |                               | 129               | Steel    | 100 1/2               | 645 Tons        |      |         |           |
|   |               |               |   |  |               |        |        |      |        | rotary scraper   | 1   |                               | 129               | Lumber   | 50 bbls               | 645 Tons        | 87   | 323     | 970       |
| EROSION CONTROL<br>STRUCTURES<br>SMALL<br>Masonry Const.      | 5793,600      | 578,360       | Unit: 2' x 12' x 17' masonry<br>Notch 5' H<br>70 CY Masonry<br>300 CY Earth fill        | 4,500 No                                 | 450 No        | +      | +      | +    | +      | 1/2 bag Conc. Mixer                                      | 10  | 40                            | 1350              | Cement   | 1 1/2 bbls per CY     | 1300 bbls       |      |         |           |
|   |               |               |   |  |               |        |        |      |        | Tractor w/bulldozer                                      | 1   | structures                    | 135               | Sand     | 1/2 CY                | 2,624 CY        | 135  | 1570    | 1570      |
|   |               |               |   |  |               |        |        |      |        | rotary scraper   | 1   | Per year                      | 135               | Rock     | 1 CY                  | 31,500 CY       | 34   | 56      | 340       |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Earth    | 300 CY / strud        | 135,000 CY      | 6    | 28      | 108       |
| Living Snow Fence and<br>Shelterbelt Planting                 |               |               | Three rows trees 6x6<br>1/4 mile per farm   | 12,000 Miles                             | 1200 miles    | ++     | -      | -    | -      | Tree planter   | 1   | 50 M per<br>Mach. Mon         | 24                | Trees    | 2640 TP /<br>1/4 mile | 3168 M.Tr.      | 1    |         | 48        |
| CONTOUR STRIP CROPPING  | 1270,000      | 127,000       |   | 1270,000                                 | 127,000       | +      | -      | +    | -      |  |     |                               |                   |          |                       |                 | 508  | 508     |           |
| WIND STRIP CROPPING   | 8,500         | 850           |   | 8,500                                    | 850           | +      | -      | +    | -      |  |     |                               |                   |          |                       |                 | 2    | 2       |           |
| SURVEYS & PLANS   |               |               | 8<br>05/A detail sur.<br>8.007/A utilit. sur.   | Man Months                               |               |        |        |      |        |  |     |                               |                   |          |                       |                 |      |         |           |
| Conservation Surveys  | 5783,564      | 1,156,713     |   | 672                                      | 134           | +      | +      | +    | -      |  |     |                               |                   |          |                       |                 | 134  |         |           |
| Individual Farm Plans   |               |               | 100 plans / unit/year.  |  | 7,023         | +      | +      | +    | +      |  |     |                               |                   |          |                       |                 | 841  | 841     | 841       |
| Flood Control Surveys   |               |               |   |  |               | +      | +      | +    | +      |  |     |                               |                   |          |                       |                 | 7    | 3       |           |
| DRAINAGE  |               |               |   |  |               |        |        |      |        |  |     |                               |                   |          |                       |                 |      |         |           |
| Maintenance Public Ditches                                    | 308,000       | 198,000       |   | 890                                      | 574           | +      | +      | +    | -      | 3/4 yd dragline  | 1   | 10 miles<br>Per<br>year       | 640               | Fuel     |                       | 640,000 Gal     | 160  | 640     | 1280      |
| Community Ditches   | 326,500       | 78,000        | 20' per Acre  | 1,240                                    | 300           | +      | +      | +    | -      | 3/4 yd dragline  | 1   | 5 M/yr.                       | 720               | Fuel     |                       | 720,000 Gal     | 180  | 720     | 1440      |
| Bridges   | 326,500       | 78,000        | 1 bridge / mile open<br>ditch   | 1240 <sup>1</sup> / <sub>2</sub> No      | 300           | +      | +      | +    | +      | 1 bag conc. mixer  | 1   | 5 CY /<br>day                 | 75                | Cement   | 1 1/2 bbls per CY     | 13,500 bbls     |      |         |           |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Sand     | 1 CY                  | 4,500 CY        |      |         |           |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Gravel   | 1 CY                  | 9,000 CY        | 50   | 150     | 1800      |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Steel    | 100 1/2               | 450 Tons        |      |         |           |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Cement   | 1 1/2 bbls            | 390 bbls        |      |         |           |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Sand     | 1 CY                  | 130 CY          | 3    | 3       | 26        |
|   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Gravel   | 1 CY                  | 260 CY          |      |         |           |
| Flood Water Intakes   | 653,000       | 4200          | 1 structure per 80 A<br>5 cy conc per<br>structure                                      | 8160 <sup>1</sup> / <sub>2</sub> No      | 52            | +      | +      | +    |        | 1 bag conc mixer   | 1   | 5 CY /<br>day                 | 3                 |          |                       |                 |      |         |           |
| Outlet Tile   | 653,000       | 5280          | 40' per Acre  | 4940 <sup>1</sup> / <sub>2</sub> Miles   | 40            | +      | +      | +    | -      | Trencher   | 1   | 100,000'<br>per year          | 25                | 10" Tile | 162 Cor/ds            | 2,100 gal       | 5    | 10      | 10        |
| Lateral Tile  | 653,000       | 4200          | 450' per Acre   | 56,350                                   | 360           | +      | +      | +    | -      | Trencher   | 1   | 100,000'<br>Per year          | 227               | 5" Tile  | 100' / gal            | 300 Cor/ds      | 42   | 100     | 100       |
| GRAND TOTAL   |               |               |   |  |               |        |        |      |        |  |     |                               |                   | Fuel     | 100' / gal            | 19,000 gal      |      |         |           |





AREA III

TABLE 9

| ACTIVITY                                    | ACRES TREATED |               | TREATMENT RATE   | QUANTITY     |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS                        |    |                     |                   |          |                        |             | LABOR MAN-MONTH |           |        |
|---|---------------|---------------|--|--------------|---------------|--------|--------|------|--------|---|----|---------------------|-------------------|----------|------------------------|-------------|-----------------|-----------|--------|
|   | Total         | 2 year period | Based on Acreage   | Total        | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT                                   |    |                     | MATERIAL AND FUEL |          |                        | Tech.       | Skilled         | Unskilled |        |
|   |               |               |  |              |               |        |        |      |        | Kind  | No | Unit Production     | Machine Months    | Kind     | Unit Consumption Rate  |             |                 |           | Amount |
| LIME PRODUCTION                             |               |               | initial application 2 Tons/A   | Tons         |               |        |        |      |        | Jan Crusher                                       | 1  |                     | 26                |          |                        |             |                 |           |        |
| Cropland                                    | 491,000       | 98,200        | 2yr 1/5 initial applie   | 982,000      | 196,400       | +      | +      | +    | ++     | Hammer Mill                                       | 1  | 100,000             | 26                | Dynamite | 1 1/3 / Ton            | 36 Tons     |                 |           |        |
| Pastureland                                 | 80,400        | 8,040         | 2yr 1/10 initial applie  | 160,800      | 16,080        | +      | +      | +    | ++     | Stationary Motor                                  | 1  | Tons                | 26                |          |                        |             |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | Belt Conveyor                                     | 3  | per                 | 18                |          |                        |             |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | Hopper  | 1  | year                | 26                |          |                        |             |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | Air Compressor                                    | 1  |                     | 26                | Fuel     | 3/4 gal/Ton            | 21,250 gal  |                 |           |        |
| Total                                       | 571,400       | 106,240       |  | 1,142,800    | 212,480       |        |        |      |        | Power Shovel                                      | 1  |                     | 26                |          |                        |             |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | 4 Trucks  | 10 |                     | 260               |          |                        |             | 88              | 178       |        |
| FERTILLIZING                                |               |               |  | Tons         |               |        |        |      |        | 10 grain drill with fert. & grass seed attachment | 1  | 200A per year       | 1256 units        |          |                        |             |                 |           |        |
| Cropland                                    |               | 452,000       | 100#/A/year rotation   |              | 91,000        | ++     | -      | -    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Pastureland                                 |               | 50,400        | 400#/A/10 years  |              | 10,000        | ++     | -      | -    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Total                                       |               | 502,400       |  |              | 101,000       |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| SEEDING                                     |               |               |  |              |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| Cropland                                    |               | 752,000       |  |              |               | ++     | -      | -    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Pastureland                                 | 181,000       | 23,900        |  |              |               | ++     | -      | -    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Total                                       |               | 775,900       |  |              |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| TERRACING                                   | 98,000        | 9,800         | 1/4 mile Terrace /A  | 9,800 Miles  | 980           | +      | -      | +    | -      | Form Tractor w/plan                               | 1  | 1/4 Total / 1/4 hr  |                   | Fuel     | 159 gal/day            | 2,100 gal   | 98              | 7         |        |
|   |               |               |  |              |               |        |        |      |        | Motorized Grader                                  | 1  | 1500 / day          | 7                 |          |                        |             |                 |           |        |
| NEW FENCE                                   |               |               | 160 rds / Farm   | 160 Miles    | 875           | +      | +      | +    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Fence removal                               |               |               | 120 rds / Farm   | 120 Miles    | 656           | +      | +      | +    | -      |   |    |                     |                   |          |                        |             |                 |           |        |
| Stone Fence Removal                         |               |               |  |              |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| Total                                       |               |               |  |              | 2386          |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| EROSION CONTROL STRUCTURES LARGE            | 2,277,000     | 227,700       | Unit: 200A Watershed 4'x4' drop in ret 20H 60 CY Concrete 5000 CY Earth fill | 320 No       | 32 No         | +      | +      | +    | -      | 1 bag Conc Mixer                                  | 1  |                     | 19                | Cement   | 1/4666 per CY Conc     | 28806 lb    |                 |           |        |
| Reinf. Conc Const.                          |               |               |  |              |               |        |        |      |        | 1/2 yd Power Shovel                               | 1  | 20                  | 19                | Sand     | 1 CY "                 | 960 CY      |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | Tractor w/bulldozer                               | 1  | structures          | 19                | Gravel   | 1 CY "                 | 1920 CY     |                 |           |        |
|   |               |               |  |              |               |        |        |      |        | Tractor   | 1  | per                 | 19                | Steel    | 100# "                 | 96 Tons     | 13              | 48        |        |
|   |               |               |  |              |               |        |        |      |        | Rotary Scraper                                    | 1  | year                | 19                | Lumber   | 50 bft "               | 96176 bft   | 26              | 89        |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Earth    | 5000 CY / struct       | 160,000 CY  |                 | 45        |        |
| EROSION CONTROL STRUCTURES SMALL            | 2,277,000     | 227,700       | Unit: 2'x12' Masonry Notch 6'H 70 CY Masonry 300 CY Earth fill               | 600 No       | 60 No         | +      | +      | +    | +      | 1 bag Conc Mixer                                  | 10 | 40                  | 180               | Cement   | 1/4666 per CY          | 17566 lb    |                 |           |        |
| Masonry Const.                              |               |               |  |              |               |        |        |      |        | Tractor w/bulldozer                               | 1  | structures          | 18                | Sand     | 1/2 CY "               | 350 CY      | 18              | 210       |        |
|   |               |               |  |              |               |        |        |      |        | rotary scraper                                    | 1  | per year            | 18                | Rock     | 1 CY "                 | 4,200 CY    | 5               | 8         |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Earth    | 300 CY / struct        | 18,000 CY   | 1               | 4         |        |
| Living Snow Fence and Shelter Belt Planting |               |               | Three rows Trees 6'x 1 1/4" Mile per farm                                    | 49,000 Miles | 4900          | ++     | -      | -    | -      | Tree planter                                      | 1  | 500 / 1700 ft       | 98                | Trees    | 2640 TP / Mile         | 12,936 TP   |                 | 196       |        |
| CONTOUR STRIP CRAPPING                      | 165,000       | 16,500        |  | 165,000      | 16,500        | +      | -      | +    | -      |   |    |                     |                   |          |                        |             | 66              | 66        |        |
| WIND STRIP CRAPPING                         |               |               |  |              |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| SURVEYS & PLANS                             |               |               |  | Man Months   |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| Conservation Surveys                        | 2,276,958     | 455,391       | 1/5 /A detail Sur. 1/100 /A util. Sur.                                       | 266          | 54            | +      | +      | +    | -      |   |    |                     |                   |          |                        |             | 54              |           |        |
| Individual Farm Plans                       |               |               | 100 plans / W Unit / year  |              | 1,749         | +      | +      | +    | +      |   |    |                     |                   |          |                        |             | 209             | 209       |        |
| Flood Control Surveys                       |               |               |  |              |               | +      | +      | +    | +      |   |    |                     |                   |          |                        |             | 7               | 3         |        |
| DRAINAGE                                    |               |               |  | Miles        |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |
| Maintenance Public Ditches                  | 44,000        | 26,900        |  | 66           | 66            | +      | +      | +    | -      | 1/4 yd dragline                                   | 1  | 10 mi / 25 per year | 74                | Fuel     |                        | 74,000 gal  | 18              | 74        |        |
| Community Ditches                           | 142,500       | 78,000        | 20' per Acre   | 540          | 300           | +      | +      | +    | -      | 1/4 yd dragline                                   | 1  | 5 mi / yr           | 720               | Fuel     |                        | 720,000 gal | 180             | 720       |        |
|   |               |               |  | No           |               |        |        |      |        | 1 bag conc mixer                                  | 1  | 5 CY Conc Per day   | 75                | Cement   | 1 1/4 bbls per CY Conc | 13,500 bbls |                 |           |        |
| Bridges                                     | 142,500       | 78,000        | 1 bridge / mile open ditch   | 540          | 300           | +      | +      | +    | +      |   |    |                     |                   | Sand     | 1 CY "                 | 4500 CY     | 50              | 150       |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Gravel   | 1 CY "                 | 9,000 CY    |                 | 1800      |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Steel    | 100# "                 | 450 Tons    |                 |           |        |
| Flood Water Intakes                         | 285,000       | 1800          | 1 structure per 80 R. 5 CY Conc. per structure                               | 3562         | 23            | +      | +      | +    | -      | 1 bag conc mixer                                  | 1  | 5 CY Conc Per day   | 1                 | Cement   | 1 1/4 bbls "           | 17266 lb    | 2               | 20        |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Sand     | 1 CY "                 | 57 CY       |                 | 20        |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Gravel   | 1 CY "                 | 115 CY      |                 |           |        |
| Outlet Tile                                 | 285,000       | 2,245         | 40' per Acre   | 2150 Miles   | 17            | +      | +      | +    | -      | Trencher  | 1  | 100,000' per year   | 11                | 10" Tile | 69 Carlds              | 900 gal     | 2               | 4         |        |
| Lateral Tile                                | 285,000       | 1800          | 450' per Acre  | 24,250 Miles | 753           | +      | +      | +    | -      | Trencher  | 1  | 100,000' per year   | 97                | 5" Tile  | 212 Carlds             | 2,100 gal   | 18              | 43        |        |
|   |               |               |  |              |               |        |        |      |        |   |    |                     |                   | Fuel     | 100 / gal              |             |                 | 43        |        |
| GRAND TOTAL                                 |               |               |  |              |               |        |        |      |        |   |    |                     |                   |          |                        |             |                 |           |        |





# AREA IV

## TABLE 10

| ACTIVITY                                    | ACRES TREATMENT |               | TREATMENT RATE  | QUANTITY  |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENT |  |                 |                     |           |                       |                  |             |         |            |     |
|---|-----------------|---------------|---|-----------|---------------|--------|--------|------|--------|---------------------------|--|-----------------|---------------------|-----------|-----------------------|------------------|-------------|---------|------------|-----|
|   | Total           | 2 year period | Based on Acreage  | Total     | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT           |  |                 | MATERIAL AND FUEL   |           |                       | LABOR MAN. MONTH |             |         |            |     |
|   |                 |               |   |           |               |        |        |      |        | Kind                      | No   | unit Production | Machine Months      | Kind      | unit Consumption rate | Amount           | Tech        | Skilled | Un skilled |     |
| LIME PRODUCTION                             |                 |               | Initial application 3 Tons/A  | Tons      |               |        |        |      |        |                           | Jaw Crusher  | 1               |                     | 37        |                       |                  |             |         |            |     |
| Cropland                                    | 465,000         | 93,000        | 2yr 1/5 initial applie  | 1,395,000 | 279,000       | +      | +      | +    | ++     |                           | Hammer Mill  | 1               | 100,000             | 37        | Dynamite              | 1/3 Ton          | 52 Tons     |         |            |     |
| Pasture land                                | 109,600         | 10,960        | 2yr 1/10 initial applie   | 329,000   | 32,900        | +      | +      | +    | ++     |                           | Stationary Plan                                    | 1               | Tons                | 37        |                       |                  |             |         |            |     |
| Total                                       | 574,600         | 103,960       |   | 1,724,000 | 311,900       |        |        |      |        |                           | Belt Conveyor                                      | 3               | per year            | 112       |                       |                  |             |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | Hopper   | 1               |                     | 37        |                       |                  |             |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | Air Compressor                                     | 1               |                     | 37        | Fuel                  | 3/4 gal/Ton      | 234,000 Gal |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | Power Shovel                                       | 1               |                     | 37        |                       |                  |             |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | 45 Truck   | 10              |                     | 370       |                       |                  |             |         | 129        | 261 |
| FERTILIZING                                 |                 |               | 100#/A/year rotation  | Tons      |               |        |        |      |        |                           | 10' grain drill with fert. & grass seed attachment | 200/A           | per year            | 679 units |                       |                  |             |         |            |     |
| Cropland                                    |                 | 249,000       |   | 60,000    |               | ++     | -      | -    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Pasture land                                |                 | 31,600        | 400#/A/10 years   | 6,000     |               | ++     | -      | -    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Total                                       |                 | 271,600       |   | 66,000    |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| SEEDING                                     |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Cropland                                    |                 | 266,000       |   |           |               | ++     | -      | -    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Pasture land                                | 134,500         | 22,700        |   |           |               | ++     | -      | -    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Total                                       |                 | 288,700       |   |           |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| TERRACING                                   | 1,000           | 100           | 1 Mile Terrace/A  | 100 Miles | 10            | +      | -      | +    | -      |                           | Form Tractor w/plan                                | 1               | 1/2 total Miles     |           |                       |                  |             |         |            |     |
| NEW FENCE                                   |                 |               | 160 rds/Farm  | 800       |               | +      | +      | +    |        |                           | Material used driver                               | 1               | 1500/day            |           | Fuel                  | 15 gal/day       | 300 Gal     | 1       | 1          | 1   |
| Fence removal                               |                 |               | 120 rds/Farm  | 600       |               | +      | +      | +    |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Stone Fence Removal                         |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Total                                       |                 |               |   | 1400      |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| EROSION CONTROL STRUCTURES LARGE            | 1,991,500       | 199,150       | Unit 200A water shed 4'x4' drop in let 20'H. 60 cy concrete 5000 cy Earthfill | 560 No    | 56 No         | +      | +      | +    | -      |                           | 1 bag Conc Mixer                                   | 1               |                     | 34        | Cement                | 1 bag per cy     | 5000 lbs    |         |            |     |
| Reinf. Conc. Const.                         |                 |               |   |           |               |        |        |      |        |                           | 2'x4' Power Shovel                                 | 1               | 20                  | 34        | Sand                  | 1/2 cy           | 1,600 cy    |         |            |     |
| EROSION CONTROL STRUCTURES SMALL            | 1,991,500       | 199,150       | Unit 2'x12' masonry notch 5'H 75 cy masonry 300 cy Earthfill                  | 1000 No   | 100 No        | +      | +      | +    | +      |                           | Tractor w/bulldozer                                | 1               | structure per year  | 34        | Gravel                | 1 cy             | 3,360 cy    |         |            |     |
| Masonry Const.                              |                 |               |   |           |               |        |        |      |        |                           | Tractor  | 1               |                     | 34        | Steel                 | 100'             | 168 Tons    |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | Rotary Scraper                                     | 1               | year                | 34        | Lumber                | 500 ft           | 168 1764 ft | 23      | 54         | 253 |
|   |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           | Earth                 | 500 cy/structure | 280,000 cy  | 46      | 156        | 78  |
|   |                 |               |   |           |               |        |        |      |        |                           | 1 bag Conc Mixer                                   | 10              | 40                  | 300       | Cement                | 1 bag per cy     | 290 lbs     |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           | Tractor w/bulldozer                                | 1               | structures per year | 30        | Sand                  | 1/2 cy           | 580 cy      | 30      | 350        | 350 |
|   |                 |               |   |           |               |        |        |      |        |                           | rotary scraper                                     |                 |                     | 30        | Rock                  | 1 cy             | 2,000 cy    | 8       | 13         | 75  |
|   |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           | Earth                 | 300 cy/structure | 30,000 cy   | 1       | 6          | 24  |
| Living Snow Fence and Shelter belt Planting |                 |               | Three rows trees 6'x6' 1/4 mile per farm                                      | 4,260     | 426           | ++     | -      | -    | -      |                           | Tree planter                                       | 1               | 50 m per Mach. Hn.  | 9         | Trees                 | 2640 ft          | 1125 Mtr.   |         | 18         | 18  |
| CONTOUR STRIP CROPPING                      | 115,000         | 11,500        |   | 115,000   | 11,500        | +      | -      | +    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| WIND STRIP CROPPING                         | 425,000         | 42,500        |   | 425,000   | 42,500        | +      | -      | +    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| SURVEYS & PLANS                             |                 |               | 8.05/A detail ser   | 1700      | 170           | +      | -      | +    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Conservation Surveys                        | 1,454,396       | 290,879       | 8.007/A 4'x12' 34r  | 168       | 34            | +      | +      | +    | -      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Individual Farm Plans                       |                 |               | 100 plans/4 unit/yr   | No        | 1,601         | +      | +      | +    | +      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Flood Control Surveys                       |                 |               |   |           |               | +      | +      | +    | +      |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| DRAINAGE                                    |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           |                       |                  |             |         |            |     |
| Maintenance Public Ditch                    | 345,000         | 60,500        |   | 588       | 103           | +      | +      | +    | -      |                           | 3/4yd dragline                                     | 1               | 100 rds per year    | 124       | Fuel                  |                  | 124,000 Gal | 31      | 124        | 248 |
| Community Ditches                           | 22,500          | 22,500        | 20' per Acre  | 85        | 85            | +      | +      | +    | -      |                           | 3/4yd dragline                                     | 1               | 15 ft/yr            | 204       | Fuel                  |                  | 204,000 Gal | 51      | 204        | 408 |
| Bridges                                     | 22,500          | 22,500        | 1 bridge/rail open ditch  | 85        | 85            | +      | +      | +    | +      |                           | 1 bag conc. mixer                                  | 1               | 5 cy conc. per day  | 26        | Cement                | 1 bag per cy     | 3,825 lbs   |         |            |     |
| Flood Water Intakes                         | 45,000          | 317           | 1 structure per 80A 5 cy Conc. per structure                                  | 560       | 4             | +      | +      | +    | +      |                           |  |                 |                     |           | Gravel                | 1 cy             | 1,275 cy    |         |            |     |
| Outlet tile                                 | 45,000          | 400           | 40' per Acre  | 340       |               | +      | +      | +    | -      |                           | 1 bag conc. mixer                                  | 1               | 5 cy conc. per day  | 1         | Steel                 | 100'             | 2,850 cy    | 14      | 43         | 516 |
| Lateral tile                                | 45,000          | 317           | 450' per Acre   | 3,840     | 27            | +      | +      | +    | -      |                           |  |                 |                     |           | Cement                | 1 bag            | 30 lbs      |         |            |     |
| GRAND TOTAL                                 |                 |               |   |           |               |        |        |      |        |                           | Trencher   | 1               | 100,000' per year   | 2         | Sand                  | 1/2 cy           | 10 cy       | 1       | 1          | 2   |
|   |                 |               |   |           |               |        |        |      |        |                           | Trencher   | 1               | 100,000' per year   | 17        | Gravel                | 1 cy             | 20 cy       |         |            |     |
|   |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           | 10" Tile              | 100 gal          | 12 Gal/4    | 1       | 2          | 2   |
|   |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           | 5" Tile               | 100 gal          | 38 Gal/4    | 3       | 8          | 8   |
|   |                 |               |   |           |               |        |        |      |        |                           |  |                 |                     |           | Fuel                  | 100 gal          | 1425 Gal    |         |            |     |





## AREA V

### TABLE II

| ACTIVITY                                       | ACRES TREATED |               | TREATMENT RATE   | QUANTITY    |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENT                                |    |                 |                   | LABOR MAN-MONTH |                       |             |         |           |
|--|---------------|---------------|--|-------------|---------------|--------|--------|------|--------|--|----|-----------------|-------------------|-----------------|-----------------------|-------------|---------|-----------|
|  | Total         | 2 year period | Based on Acreage   | Total       | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT  |    |                 | MATERIAL AND FUEL |                 |                       | Tech        | Skilled | Unskilled |
|  |               |               |  |             |               |        |        |      |        | Kind   | No | Unit Production | Mach. Man         | Kind            | Unit Consumption rate |             |         |           |
| LIME PRODUCTION                                |               |               | initial application<br>3 Tons / A  | Tons        | Tons          |        |        |      |        | Jaw Crusher  | 1  |                 | 32                |                 |                       |             |         |           |
| Cropland                                       | 378,000       | 75,600        | 2yr 1/2 initial appl.  | 1,134,000   | 226,800       | +      | +      | +    | ++     | Hammer Mill  | 1  | 100,000         | 32                | Dynamite        | 1/3 / Ton             | 44 Tons     |         |           |
| Pasture land                                   | 119,200       | 11,920        | 2yr 1/10 initial appl.   | 357,600     | 35,760        | +      | +      | +    | ++     | Stationary Motor   | 1  | Tons            | 32                |                 |                       |             |         |           |
| Total  | 497,200       | 87,520        |  | 1,491,600   | 262,560       |        |        |      |        | Belt Conveyor  | 3  | per year        | 96                |                 |                       |             |         |           |
|  |               |               |  |             |               |        |        |      |        | Hopper   | 1  |                 | 32                |                 |                       |             |         |           |
|  |               |               |  |             |               |        |        |      |        | Air Compressor   | 1  |                 | 32                | Fuel            | 3/4 gal / Ton         | 197,000 Gal |         |           |
|  |               |               |  |             |               |        |        |      |        | Power Shovel   | 1  |                 | 32                |                 |                       |             |         |           |
|  |               |               |  |             |               |        |        |      |        | 4 Ton Truck  | 10 |                 | 320               |                 |                       |             | 108     | 220       |
| FERTILLIZING                                   |               |               |  |             | Tons          |        |        |      |        | 10' grain drill with<br>fert. & grass seed<br>attachment |    | 200R / year     | 563               |                 |                       |             |         |           |
| Cropland                                       |               | 188,000       | 100# / A / year rotation   |             | 46,800        | ++     | -      | -    | -      |  |    |                 |                   |                 |                       |             |         |           |
| Pasture land                                   |               | 37,400        | 400# / A / 10 years  |             | 7,400         | ++     | -      | -    | -      |  |    |                 |                   |                 |                       |             |         |           |
| Total  |               | 225,400       |  |             | 54,200        |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| SEEDING  |               |               |  |             |               |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| Cropland                                       |               | 208,000       |  |             |               | ++     | -      | -    | -      |  |    |                 |                   |                 |                       |             |         |           |
| Pasture land                                   | 140,100       | 16,370        |  |             |               | ++     | -      | -    | -      |  |    |                 |                   |                 |                       |             |         |           |
| Total  |               | 224,370       |  |             |               |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| TERRACING                                      | 12,000        | 1200          | 1 mile Terrace / A   | 1200 Miles  | 120           | +      |        | +    |        | Farm Tractor w / Plow                                    |    | 1/2 Total Miles |                   |                 |                       |             |         |           |
| NEW FENCE                                      |               |               | 160 rds / Farm   | Miles 775   |               |        |        |      |        | Motorized Grader   |    | 1500' / day     | 9                 | Fuel            | 15 gal / day          | 2,700 Gal.  | 12      | 9         |
| Fence removal                                  |               |               | 120 rds / Farm   | 590         |               |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| Stone Fence Removal                            |               |               |  |             |               |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| Total  |               |               |  |             | 1365          |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| EROSION CONTROL<br>STRUCTURES<br>LARGE         | 1,041,700     | 104,170       | Unit 200 A W. washed<br>4 1/4' drop inlet 20' H.<br>60 CY Concrete<br>5000 CY Earth fill | 775 No      | 78 No         | +      | +      | +    | -      | 1 bag Conc Mixer   | 1  |                 | 47                | Cement          | 1 1/2 bbls per CY     | 7,020 bbls  |         |           |
| Reinf. Conc. Const.                            |               |               |  |             |               |        |        |      |        | 1/2 yd Power Shovel                                      | 1  | 20              | 47                | Sand            | 1 1/2 CY              | 2340 CY     |         |           |
|  |               |               |  |             |               |        |        |      |        | Tractor w / bulldozer                                    | 1  | structures      | 47                | Gravel          | 1 CY                  | 4,680 CY    |         |           |
|  |               |               |  |             |               |        |        |      |        | Tractor  | 1  | per year        | 47                | Steel           | 100#                  | 234 Tons    |         |           |
|  |               |               |  |             |               |        |        |      |        | Rotary Scraper   | 1  |                 | 47                | Lumber          | 506 bbls              | 234 MAF     | 31      | 117       |
|  |               |               |  |             |               |        |        |      |        |  |    |                 |                   | Earth           | 506 CY / struct       | 390,000 CY  | 81      | 272       |
| EROSION CONTROL<br>STRUCTURES<br>SMALL         | 1,041,700     | 104,170       | Unit 1 2 1/2' Masonry<br>Notch 5' H.<br>70 CY Masonry<br>300 CY Earth fill               | 1500 No     | 150 No        | +      | +      | +    | +      | 1 bag Conc Mixer   | 10 | 40              | 420               | Cement          | 1 1/2 bbls per CY     | 438 bbls    |         |           |
| Masonry Const.                                 |               |               |  |             |               |        |        |      |        | Tractor w / bulldozer                                    | 1  | structures      | 42                | Sand            | 1 1/2 CY              | 876 CY      | 45      | 525       |
|  |               |               |  |             |               |        |        |      |        | rotary scraper   | 1  | per year        | 42                | Rock            | 1 CY                  | 10,500 CY   | 11      | 19        |
|  |               |               |  |             |               |        |        |      |        |  |    |                 |                   | Earth           | 300 CY / struct       | 45,000      | 2       | 9         |
| Living Snow Fence and<br>Shelter belt Planting |               |               | 3 row tree 8 x 6<br>1/4 mile / farm  | 2,230 Miles | 223           | ++     | -      | -    | -      | Tree planter   | 1  | 500' / Mach M   | 5                 | Trees           | 2640' / Mile          | 580 M.Tr.   |         | 10        |
| CONTOUR STRIP CROPPING                         | 101,300       | 10,130        |  | 101,300     | 10,130        | +      | -      | +    | -      |  |    |                 |                   |                 |                       |             | 40      | 40        |
| WIND STRIP CROPPING                            | 9,500         | 950           |  | 9,500       | 950           | +      | -      | +    | -      |  |    |                 |                   |                 |                       |             | 2       | 2         |
| SURVEYS & PLANS                                |               |               |  |             | Man Month     |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |
| Conservation Surveys                           | 606,350       | 121,270       | # .05 / A detail<br># .007 / A util. sur   | 76          | 15            | +      | +      | +    | -      |  |    |                 |                   |                 |                       |             | 15      |           |
| Individual Farm Plans                          |               |               | 100 plans / unit / yr  |             | 1550          | +      | +      | +    | +      |  |    |                 |                   |                 |                       |             | 185     | 185       |
| Flood Control Survey                           |               |               |  |             |               | +      | +      | +    | +      |  |    |                 |                   |                 |                       |             | 7       | 3         |
| GRAND TOTAL                                    |               |               |  |             |               |        |        |      |        |  |    |                 |                   |                 |                       |             |         |           |





AREA VI

TABLE 12

| ACTIVITY                                   | ACRES TREATED |               | TREATMENT RATE   | QUANTITY  |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS |                 |                 |                   | LABOR MAN-MONTH |                       |             |         |           |
|--|---------------|---------------|--|-----------|---------------|--------|--------|------|--------|----------------------------|-----------------|-----------------|-------------------|-----------------|-----------------------|-------------|---------|-----------|
|  | Total         | 2 year period | Based on Acreage   | Total     | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT            |                 |                 | MATERIAL AND FUEL |                 |                       | Tech        | skilled | unskilled |
|  |               |               |  |           |               |        |        |      |        | Kind                       | No.             | Unit Production | Mach. Mon.        | Kind            | Unit Consumption Rate |             |         |           |
| LIME PRODUCTION                            |               |               | initial application<br>3 1/2 Tons/A  | Tons      | Tons          |        |        |      |        | Jan Crusher                | 1               | 100,000         | 128               |                 |                       |             |         |           |
| Cropland                                   | 1,047,000     | 209,400       | 2yr 1/2 initial applie   | 3,665,000 | 733,000       | +      | +      | +    | ++     | Hammer Mill                | 1               |                 | 128               | Dynamite        | 1/3 #/Ton             | 179 Tons    |         |           |
| Pasture land                               | 960,000       | 96,000        | 2yr 1/2 initial applie   | 3,359,500 | 335,950       | +      | +      | +    | ++     | Stationary Motor           | 1               | Tons            | 385               |                 |                       |             |         |           |
|  |               |               |  |           |               |        |        |      |        | Belt Conveyor              | 3               | per year        | 128               |                 |                       |             |         |           |
|  |               |               |  |           |               |        |        |      |        | Hepper                     | 1               |                 | 128               |                 |                       |             |         |           |
|  |               |               |  |           |               |        |        |      |        | Air Compressor             | 1               |                 | 128               | Fuel            | 3/4 gal/Ton           | 801,750 Gal |         |           |
|  |               |               |  |           |               |        |        |      |        | Power shovel               | 1               |                 | 128               |                 |                       |             |         |           |
| Total                                      | 2,007,000     | 305,400       |  | 7,024,500 | 1,068,950     |        |        |      |        | 4 Ton Truck                | 10              |                 | 1280              |                 |                       |             | 440     | 896       |
| FERTILLIZING                               |               |               |  | Tons      |               |        |        |      |        | 10' grain drill with       |                 | 200 A/year      | 1334 units        |                 |                       |             |         |           |
| Cropland                                   |               | 436,000       | 100 #/A/year rotation  |           | 109,000       | +      | -      | -    | -      | fer + grass seed           |                 |                 |                   |                 |                       |             |         |           |
| Pasture land                               |               | 97,600        | 400 #/A/10 years   |           | 29,600        | +      | -      | -    | -      | attachment                 |                 |                 |                   |                 |                       |             |         |           |
| Total                                      |               | 533,600       |  |           | 138,600       |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| SEEDING                                    |               |               |  |           |               |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| Cropland                                   |               | 512,000       |  |           |               | ++     | -      | -    | -      |                            |                 |                 |                   |                 |                       |             |         |           |
| Pasture land                               | 995,000       | 132,300       |  |           |               | ++     | -      | -    | -      |                            |                 |                 |                   |                 |                       |             |         |           |
| Total                                      |               | 644,300       |  |           |               |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| TERRACING                                  | 207,000       | 20,700        | 17 mile Terrace/A  | 20,700    | 2,070         | +      | -      | +    | -      | Farm Tractor w/plow        | 1/2 Total/17.65 |                 |                   |                 |                       |             |         |           |
|  |               |               |  |           |               |        |        |      |        | Flat or ridge Grader       | 1500/day        | 15              |                   | Fuel            | 15 gal/day            | 4,500 Gal   | 207     | 15        |
| NEW FENCE                                  |               |               | 160 rds / Farm   |           | 1615          |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| Fence removal                              |               |               | 120 rds / Farm   |           | 1210          |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| Stone Fence Removal                        |               |               |  |           |               |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| Total                                      |               |               |  |           | 2825          |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| EROSION CONTROL STRUCTURES LARGE           | 2484,200      | 248,420       | Unit: 200 A Watershed<br>4x4' drop in let 20' H.<br>60 CY Concrete<br>5000 CY Earth fill | 260       | 26            | +      | +      | +    | -      | 1 bag Conc Mixer           | 1               |                 | 16                | Cement          | 1 1/2 bbls per CY     | 2,340 bbls  |         |           |
| Reinf. Conc. Const.                        |               |               |  |           |               |        |        |      |        | 1/2 yd Power shovel        | 1               | 20              | 16                | Sand            | 1/2 CY                | 780 CY      |         |           |
|  |               |               |  |           |               |        |        |      |        | Tractor w/pulldog          | 1               | structures      | 16                | Gravel          | 1 CY                  | 1,560 CY    |         |           |
|  |               |               |  |           |               |        |        |      |        | Tractor                    | 1               | per             | 16                | Steel           | 100 #                 | 78 Tons     |         |           |
|  |               |               |  |           |               |        |        |      |        | Rotary scraper             | 1               | year            | 16                | Lumber          | 5000 CY/struct        | 78 Mbdft    | 16      | 59        |
|  |               |               |  |           |               |        |        |      |        |                            |                 |                 |                   | Earth           | 5000 CY/struct        | 130,000 CY  | 21      | 72        |
| EROSION CONTROL STRUCTURES SMALL           | 2484,200      | 248,420       | Unit: 2'x12' masonry<br>Hatch 5'H.<br>70 CY Masonry<br>300 CY Earth fill                 | 500       | 50            | +      | +      | +    | +      | 1/2 bag Conc Mixer         | 10              | 40              | 150               | Cement          | 1 1/2 bbls per CY     | 146 bbls    |         |           |
| Masonry Const.                             |               |               |  |           |               |        |        |      |        | Tractor w/pulldog          | 1               | structures      | 15                | Sand            | 1/2 CY                | 292 CY      | 15      | 175       |
|  |               |               |  |           |               |        |        |      |        | rotary scraper             | 1               | per year        | 15                | Rock            | 1 CY                  | 3,500 CY    | 4       | 6         |
|  |               |               |  |           |               |        |        |      |        |                            |                 |                 |                   | Earth           | 300 CY/struct         | 15,000 CY   | 1       | 3         |
| Living Snow Fence and Shelterbelt Planting |               |               | Three rows trees 6x6'<br>1/4 mile / Farm   | 53,000    | 5,300         | ++     | -      | -    | -      | Tree planter               | 1               | 50M/1700 ft     | 106               | Trees           | 2640 ft/17 mile       | 13,992 M.T. |         | 212       |
| CONTOUR STRIP CROPPING                     | 520,000       | 52,000        |  | 520,000   | 52,000        | +      | -      | +    | -      |                            |                 |                 |                   |                 |                       |             | 208     | 208       |
| WIND STRIP CROPPING                        | 84,000        | 8,400         |  | 84,000    | 8,400         | +      | -      | -    | -      |                            |                 |                 |                   |                 |                       |             | 17      | 17        |
| SURVEYS & PLANS                            |               |               | \$ .05/A - detail sur.   |           | Man Month     |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |
| Conservation Surveys                       | 2042,545      | 408,509       | \$ .007/A util. sur.   | 236       | 47            | +      | +      | +    | -      |                            |                 |                 |                   |                 |                       |             | 47      |           |
| Individual Farm Plans                      |               |               | 100 plans/unit/year  |           | 3230 No       | +      | +      | +    | +      |                            |                 |                 |                   |                 |                       |             | 386     | 386       |
| Flood Control Survey                       |               |               |  |           |               | +      | +      | +    | +      |                            |                 |                 |                   |                 |                       |             | 7       | 3         |
| GRAND TOTAL                                |               |               |  |           |               |        |        |      |        |                            |                 |                 |                   |                 |                       |             |         |           |





## AREA VII

TABLE 13

| ACTIVITY                                      | ACRES TREATMENT |               | TREATMENT RATE                      | QUANTITY  |               | SEASON |        |      |        | 2 YEAR PERIOD REQUIREMENTS |     |                 |                   | LABOR MAN-MONTH |                       |                 |       |         |           |
|---|-----------------|---------------|-------------------------------------|-----------|---------------|--------|--------|------|--------|----------------------------|-----|-----------------|-------------------|-----------------|-----------------------|-----------------|-------|---------|-----------|
|   | Total           | 2 year period | Based on Acreage                    | Total     | 2 year period | Spring | Summer | Fall | Winter | MAJOR EQUIPMENT            |     |                 | MATERIAL AND FUEL |                 |                       | LABOR MAN-MONTH |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | Kind                       | No. | Unit Production | Mach. Mon.        | Kind            | Unit Consumption rate | Amount          | Tech. | Skilled | Unskilled |
| LIME PRODUCTION                               |                 |               | initial application                 |           |               |        |        |      |        | Jaw Crusher                | 1   |                 | 22                |                 |                       |                 |       |         |           |
| Cropland                                      | 302,000         | 60,400        | 3 Tons/A                            | Tons      |               |        |        |      |        | Hammer Mill                | 1   | 100,000         | 22                | Dynamite        | 1/3/Ton               | 30 Tons         |       |         |           |
| Pasture land                                  | -               | -             | 2yr 1/2 initial applc.              | 906,000   | 181,200       | +      | +      | +    | ++     | Stationary Motor           | 1   | Tons            | 22                |                 |                       |                 |       |         |           |
| Total   | 302,000         | 60,400        | 2yr 1/2 initial applc.              | 906,000   | 181,200       |        |        |      |        | Belt Conveyor              | 3   | Per year        | 66                |                 |                       |                 |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | Hopper                     | 1   |                 | 22                |                 |                       |                 |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | Air Compressor             | 1   |                 | 22                | Fuel            | 3/4 gal/Ton           | 135,900 Gal     |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | Power shovel               | 1   |                 | 22                |                 |                       |                 |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | 4 Ton Truck                | 10  |                 | 220               |                 |                       |                 |       | 75      | 152       |
| FERTILLIZING                                  |                 |               |                                     |           |               |        |        |      |        | 10' grain drill with       |     | 200A/year       | 775 units         |                 |                       |                 |       |         |           |
| Cropland                                      |                 | 310,000       | 100 #A/year rotation                | Tons      | 62,000        | ++     | -      | -    | -      | fertilizer grass seed      |     |                 |                   |                 |                       |                 |       |         |           |
| Pasture land                                  |                 | -             | 400 #A/10 years                     |           |               | ++     | -      | -    | -      | attach.                    |     |                 |                   |                 |                       |                 |       |         |           |
| Total   |                 | 310,000       |                                     |           | 62,000        |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| SEEDING                                       |                 |               |                                     |           |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Cropland                                      |                 | 586,000       |                                     |           |               | ++     | -      | -    | -      |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Pasture land                                  |                 |               |                                     |           |               | ++     | -      | -    | -      |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Total   |                 |               |                                     |           |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| TERRACING                                     | 6,000           | 600           | .1 mile Terrace /A                  | 600 Miles | 60            | +      | -      | +    | -      | Farm Tractor w/plow        |     | 1/2 Total Miles |                   |                 |                       |                 |       |         |           |
| NEW FENCE                                     |                 |               | 160 rds/Farm                        | Miles     | 552           |        |        |      |        | Rat sized Grader           |     | 1500/day        | 4                 | Fuel            | 15 gal/day            | 1,200 Gal.      | 6     | 4       | 4         |
| Fence removal                                 |                 |               | 120 rds/Farm                        | Miles     | 414           |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Stone Fence Removal                           |                 |               |                                     |           |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Total   |                 |               |                                     |           | 966           |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| EROSION CONTROL                               |                 |               | Unit: 200 ft watershed              |           |               |        |        |      |        | 1 bag Conc Mixer           | 1   |                 | 12                | Cement          | 1 1/2 bags/cy         | 1800 lbs        |       |         |           |
| STRUCTURES                                    | 3,052,800       | 305,280       | 4x4' drop inlet 20'h.               | No.       |               |        |        |      |        | Yd Power Shovel            | 1   | 20              | 12                | Sand            | 1/2 CY "              | 600 C.Y.        |       |         |           |
| LARGE   |                 |               | 60 cy Concrete                      |           |               |        |        |      |        | Tractor w/bulldozer        | 1   | structures      | 12                | Gravel          | 1 CY -"               | 1200 C.Y.       |       |         |           |
| Reinf. Conc Const.                            |                 |               | 5000 cy Earth fill                  | 200       | 20            | +      | +      | +    | -      | Tractor                    | 1   | per year        | 12                | Steel           | 100# -"               | 60 Tons         |       |         |           |
|   |                 |               |                                     |           |               |        |        |      |        | Rot ary scraper            | 1   |                 | 12                | Lumber          | 50 bft'               | 60 Mbd Ft.      | 8     | 30      | 90        |
| EROSION CONTROL                               |                 |               | Unit 2' x 12' masonry               | No.       |               |        |        |      |        |                            |     |                 |                   | Earth           | 5000CY/struct         | 100,000 C.Y.    | 17    | 56      | 28        |
| STRUCTURES                                    | 3,052,800       | 305,280       | Notch 5'h.                          |           |               |        |        |      |        | 1 bag Conc Mixer           | 10  | 40              | 120               | Cement          | 1/2 bag/CY            | 117 lbs         |       |         |           |
| SMALL   |                 |               | 70cy Masonry                        | 400       | 40            | +      | +      | +    | +      | Tractor w/bulldozer        | 1   | structures      | 12                | Sand            | 1/2 CY                | 234 C.Y.        | 12    | 140     | 140       |
| Masonry Const.                                |                 |               | 300 c.y. Earth fill                 |           |               |        |        |      |        | rotary scraper             | 1   | per year        | 12                | Rock            | 1 CY                  | 2800 C.Y.       | 3     | 5       | 30        |
|   |                 |               |                                     |           |               |        |        |      |        |                            |     |                 |                   | Earth           | 300CY/struct          | 12,000 C.Y.     | 1     | 2       | 10        |
| Living Stream Fence and Shelter belt Planting |                 |               | Three rows trees 6x6' 1/4 mile/farm | 65,000    | 6500          | ++     | -      | -    | -      | Tree planter               | 1   | 50% Prod./yr    | 130               | Trees           | 2640 ft/mile          | 17,160 MT.      |       |         | 260       |
| CONTOUR STRIP CROPPING                        | 70,000          | 7,000         |                                     |           |               | +      | -      | +    | -      |                            |     |                 |                   |                 |                       |                 | 28    | 28      |           |
| WIND STRIP CROPPING                           | 20,000          | 2,000         |                                     |           |               | +      | -      | +    | -      |                            |     |                 |                   |                 |                       |                 | 4     | 4       |           |
| SURVEYS & PLANS                               |                 |               | 8                                   |           |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Conservation Surveys                          | 3,051,749       | 610,349       | as/A detail sur.                    | Man/month |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |
| Individual Farm Plans                         |                 |               | 1000/A utilit. sur.                 | 48        | 10            | +      | +      | +    | -      |                            |     |                 |                   |                 |                       |                 | 10    |         |           |
| Flood Control Surveys                         |                 |               | 100 plans/w. unit/year              | No.       | 1105          | +      | +      | +    | +      |                            |     |                 |                   |                 |                       |                 | 132   | 132     | 132       |
| GRAND TOTAL                                   |                 |               |                                     |           |               |        |        |      |        |                            |     |                 |                   |                 |                       |                 |       |         |           |





## II. DEVELOPMENT AND CONSERVATION OF PHYSICAL RESOURCES, (FORESTS AND WOODLANDS)

### Wisconsin Forest Lands

The most acute forestry problem in Wisconsin lies in the so-called "cutover area" which came into being as a result of reducing the original forested area of 30,000,000 acres to about 17,000,000 acres. In this area, agriculture has failed to materialize to the extent necessary to support a reasonable standard of living for the rural population.

A study of the situation by the Wisconsin Legislature points to the resultant tax delinquency in the cutover area, and suggests that proper land use be made effective as soon as possible in order that each acre produce that for which it is best suited.

One of the main solutions is to put most of this idle and tax delinquent land into timber production by both private and public agencies.

Depleted as the timber resources are today, they still represent a substantial part of the state's wealth. Aside from the assessed valuation of the timber lands, the value of the wood-using plants totals over 400 million dollars, and these plants employ more than 100,000 people. This value is largely represented in paper mills in the Wisconsin and Fox River Valleys.

Rather recent figures show a lumber cut in the state of about 469,000,000 board feet annually, of which about 139,000,000 board feet are exported. The consumption in the state is about 885,000,000 board feet, of which about 555,000,000 are imported. There are some 1200 active sawmills in the state, employing about 10,000 men. The employment in the woods to supply the mills will be close to 15,000 men. This does not include a much greater number of men working in the woods getting other forest products, such as pulpwood.

The present timber stand is about 17,000,000,000 board feet, excluding about 6,000,000 cords of pulpwood.

The present ownership pattern shows 8 state forests with an acreage of 218,000; 21 state parks, 13,000 acres; county lands, 3,000,000 acres; school forests, 217, with an acreage of 11,000; 7 community forests, 3,000 acres; national forests, 1,406,000 acres; Indian reservations, 510,000 acres; farm woodlots, 5,000,000 acres. The balance is made up of industrial forests and recreational lands and farm lands.

There is an urgent need for the restoration and maintenance of the productive capacity of all the basic and renewable resources located in the forest area in order to create and maintain an economy that will help solve rural problems, create added security and stability

for families, communities, industry and labor. In addition to the value of the timber resources in the forest area, good land use will provide water conservation, control of soil erosion and floods, recreational opportunities, and food and cover for increased wild-life populations. The forest area also offers a means of constructively offsetting some of the undesirable effects in the aftermath of the war by providing a labor outlet in its reconstruction.

Unless private enterprise, through proper incentive, is able and willing to do more in the restoration and proper management of the forest area, it may be necessary ultimately to develop some 10,000,000 acres of forest land as state, county, community or federal forests.

While a figure of 5,000,000 acres is generally accepted as the approximate area of farm woodlands in Wisconsin, the 1939 census reports indicate but 4,120,877 acres. In 1929, the census reported 5,705,390 acres in farm woodland. Due to changes in reporting procedure, the 1929 and 1939 census figures are not entirely comparable. It is probable the drop in farm woodlands in the ten-year period from 1929 to 1939 has amounted to about 700,000 acres, rather than 1,500,000 acres which the census figures would indicate.

Out of a total of 186,735 farms reporting in the 1940 census for Wisconsin, 118,945 farms or 64% indicated woodland included in the farm. It was reported that in 1939 the value of forest products sold from Wisconsin farms totaled \$1,808,920 or approximately 1.1% of the entire value of all crops. In 1929 forest products represented 2.2% of the value of all crops sold and totaled \$5,028,167 in dollar value.

The census figures for 1929 also allowed a value of \$16,925,577 for woodlot products used on the farm. This is a ratio of approximately three dollars of products used on the farm to one dollar sold. This ratio was apparent in 1910 also, and if accepted as reasonable, would indicate in 1939 (for which no census figures on home consumption were collected) a home consumption of \$5,400,000 in value of forest products.

The above indicated drop in values of farm woodlot products is indicative of woodlot depletion. While no statistics are available on timber stands in farm woodlots as such, it is known there has been serious overcutting complicated by pasturing livestock in the woodlots. The use of woodlots as supplemental pasturo has been very detrimental to Wisconsin woodlots and has eliminated satisfactory reproduction in most of the stands.

Far more vigorous action is required in the future in stimulating farmer interest in woodlots than has been taken in the past if woodlots are to assume their proper position in rural Wisconsin economy.

Based upon advisable land use in agricultural areas, the Soil Conservation Service has estimated 5,452,000 acres of land should remain permanently in farm woodlands or in publicly owned woodlands interspersed in agricultural zones. The same service estimated

579,000 acres of badly eroded and depleted pasture land and 485,000 acres of submarginal cropland should be converted to woodland. It has also been recommended that 81,000 acres of existing woodland be converted to pasture.

Under the impact of war, cutting in both farm woodlands and in commercial forest areas in Wisconsin has been greatly accelerated. The principal limitation on cutting has been the shortage of labor and while there have been some notable examples of wise selective cutting, this has generally not been the rule. Considerable cutting of red, white and jack pine second growth for pulpwood has taken place.

Of the original vast stand of virgin timber in Wisconsin, probably not more than 40,000 acres will remain uncut at the close of the present war. At present, there is estimated to be not more than 25,000 acres of virgin timber in private commercial holdings and approximately 20,000 acres in Indian lands and publicly-owned holdings of one type or another. The bulk of the timber stand in Wisconsin is now second growth or timber remaining on areas on which a selective cutting has been made.

A notable war time development has been the purchase of second growth stands by the Wisconsin paper mill companies. These companies plan to administer these areas upon genuine sustained yield policies. At least five of the major companies have embarked upon a program of consolidating and developing company forests. Some of the companies have purchased former county forest lands.

#### A. Capital Improvements - Wisconsin

The State Conservation Department of Wisconsin, in submitting their work load estimates, had the following statement to make:

##### Foreword

The post-war work plan submitted presupposes a sharp reduction of opportunities for employment in the various industries during the period of unavoidable readjustment.

The first premise of the plan is public concern in providing employment for those in need of work, and willing and able to work. Relief cases are to be left to the welfare agencies.

From past experience it has been clearly demonstrated that in the realm of conservation there are vast fields of activities which are not only useful but needed to support the commonwealth and stabilize its economy. The only partially carried-out work plans prepared for the use of now defunct emergency work organizations bear testimony to that effect. The amount of work left unfinished is enormous, and new problems and needs arise continually.



It is suggested to limit types of post-war work to those which justify contribution of state funds, whether from the budget of the department or especially appropriated to the department for this plan. In this connection we might also mention the county forest funds which on July 1, 1944 will have reached a total of \$400,000.00. Funds are accumulating from the \$180,000.00 annual aid, due to present labor shortage.

This participation in the financing of the post-war program by the department or the local agencies cooperating with it, means work of the following character:

1. Construction and maintenance of improvements needed in the operation of the department's activities;
2. Establishment or development of natural resources under the control of the department in so far as they give promise of future returns on the investment;
3. Such work on privately-owned lands as provides public benefits, but does not add to the value of the property, as, for example, construction and maintenance of fire-breaks and forest protection telephone lines, or such measures as are necessary to control insects and diseases attacking conservation values.

It is hoped that any federal funds provided for an employment program be allocated directly to federal agencies and through them to state agencies, each agency to provide supervision, for example, federal funds for work on national forests to be allotted to the U. S. Forest Service; similarly, any federal funds for work on forest lands under state control to be allotted to the states through the Forest Service, on the basis of the procedure established by the Clarke-McNary Law, with the states to match funds and provide supervision on approved projects.

If work camps are needed, the thought of operating them under the procedure used by the U. S. Forest Service on the New England Timber Salvage project might be given serious consideration.

With reference to general measures only this may be said: With a marked increase of industrial forest acreage in Wisconsin, provision for federal credit for private forestry would help to stabilize employment on industrial forests in periods of lowered income of the wood using industries, thus contributing to employment in the woods.

The plan of work for the State Conservation Department may be summarized in terms of man-years of work required as follows: The work is grouped under the respective administrative divisions charged with executing the program.



|  |        |     |       |
|--|--------|-----|-------|
| 1. Forest Protection   |        |     |       |
| Protection against fire  | 1,968  | man | years |
| 2. State Forests and Parks   |        |     |       |
| Insect, disease and rodent control   | 45     | "   | "     |
| Forest recreation  | 600    | "   | "     |
| Administration, forest properties  | 900    | "   | "     |
| Forest research  | 5      | "   | "     |
| 3. Cooperative Forestry  |        |     |       |
| Forest planting and TSI  | 5,220  | "   | "     |
| 4. Game Management   |        |     |       |
| Fencing, posting and planting  | 256    | "   | "     |
| Brushing, dykes and dams   | 86     | "   | "     |
| Misc. plantings, construction  | 122    | "   | "     |
| Deer feeding, roads and trails   | 152    | "   | "     |
| 5. Fisheries, (Propagation of Game Fish and<br>Eradication of Rough Fish)          |        |     |       |
| Construction of rearing ponds  | 463    | "   | "     |
| Facilities for removing rough fish   | 375    | "   | "     |
| Lake and stream clean-up, planting of<br>banks                                     | 7,190  | "   | "     |
| 6. Biology (Fishery Research)  |        |     |       |
| Relief map of Wisconsin  | 50     | "   | "     |
| Study of Black River and Lake Arbutus  | 40     | "   | "     |
| Trout streams studies on CWCA  | 20     | "   | "     |
| Lake and stream mapping  | 2,500  | "   | "     |
| Fish census  | 2,500  | "   | "     |
| Minnow culture on CWCA   | 20     | "   | "     |
| Minnow inventory on CWCA   | 20     | "   | "     |
| Lake front studies   | 20     | "   | "     |
| Upper Mississippi River survey   | 20     | "   | "     |
| Carp and game fish in Madison lakes  | 25     | "   | "     |
| 7. Water regulatory Board in Cooperation with<br>Wisconsin Conservation Department |        |     |       |
| Improvements of drainage control dams  | 41     | "   | "     |
| Improvements of drainage ditches   | 22     | "   | "     |
| Replacing of timber dams with concrete   | 75     | "   | "     |
| Enlarging and rebuilding dams, dykes, etc.   | 113    | "   | "     |
| New dams and dykes   | 200    | "   | "     |
| Research projects  | 30     | "   | "     |
| <hr/>  |        |     |       |
| Total  | 23,078 | man | years |

The work program on the national forests in Wisconsin based upon a three-year undertaking calls for 4,878.2 man years. This is distributed as follows:

|                             |         |           |   |
|-----------------------------|---------|-----------|---|
| Protection against fire     | 524.7   | man years |   |
| Timber development          | 1,640.9 | "         | " |
| Research                    | 7.0     | "         | " |
| Wildlife Development        | 565.8   | "         | " |
| Insect and disease control  | 50.7    | "         | " |
| Recreation Development      | 346.6   | "         | " |
| Acquisition of Lands        | 63.5    | "         | " |
| General Administrative      |         |           |   |
| Improvements                | 1,070.8 | "         | " |
| Surveys and Inventories     | 118.3   | "         | " |
| Maintenance of Improvements | 272.9   | "         | " |
| Operating Projects          | 216.0   | "         | " |

A program of 2,488 man years is set up as an estimate of accomplishment by farmers on their own woodlots. This estimate is confined to planting areas to be converted to woodlots and to fencing woodlots.

No estimates are available as to work to be done on privately-owned non-farm forest land. Much of the State Conservation Department fire protection and improvement work will be done on this type of land but no estimates as to the ratio between public and private lands involved was obtainable.

The grand total of forest conservation work to be done in Wisconsin in the immediate post-war period, according to available estimates, calls for an expenditure of 30,439.4 man years of labor. This, if spread over a three-year period, means more than 10,000 men fully employed in the event a public works program becomes necessary.

Concerning the recommended projects the State Conservation Department offers the following comments for the several classes of work to be undertaken:

1. Forest Planting and Timber Stand Improvement.

The county forests and federal lease lands constitute an enormous area for public employment on projects which will bring future returns. Forest planting, as during the last period, will be limited only by the planting stock then available. The present extensive plantations bring in a new type of work, plantation release, a job which can be done during most of the year. Timber stand improvement, which includes all types of cultural cutting in young stands, can be done throughout the year. This type of work alone may take up all the men who may be available, though it will require a much larger staff of foresters to select the best areas and supervise the work.

As an indication of the volume of work needed to be done, it will be recalled that during the CCC period the state camps very properly were instructed that forest protection projects were first priority, with forest planting given a high rating

for spring and fall. It was only toward the end, when most of the camps were gone, that TSI projects were initiated, and consequently no impression was made on this type of work.

The first priority for planting represents three to four years' nursery output.

## 2. Insect - Disease - Rodent Control

Contemplated establishment of three permanent field stations for the application of knowledge on forest insect, disease and rodent control on areas of land as indicated on attached Form 1-FL-R9--one for northeastern counties, one for northwestern counties and one for central and southern counties. Staffed on annual basis by five men-- a forest entomologist, a plant pathologist, a rodent control expert and two assistants, all year-long men. Buildings for these field stations now available.

## 3. Recreation on Forest Lands

Contemplated improvement of camping and picnic areas, beach improvement, domestic water supplies, sanitary facilities, shelter buildings, access roads and similar work concerned with recreation on state and county forest lands.

## 4. Administration Forest Properties

Contemplated headquarters and ranger station improvements on state and county forests, also surveys of forest land and structures for domestic use, storage and service buildings, laboratories and similar establishments.

## 5. Forest Wildlife Development

### a. Fisheries Research

It is difficult to outline a research plan that will fit into a general work program because research in fundamental fishery management demands persons with technical training in the biological sciences. There is, however, the need for a great many facts that can be obtained by workers who have at least an average ability to observe and record with accuracy. Therefore, the projects submitted herewith are with that thought in mind. As the work develops, persons showing aptitude can be given more responsible assignments.

The statewide creel census and lake and stream charting projects are suggested because to properly manage the fisheries it is necessary to know the annual production. Charting of lakes and streams gives the total area and physical features of each body of water. Both can utilize a large number of men.

The C.W.C.A. has been neglected from the standpoint of obtaining factual biological information and the results of proposed projects will be most valuable to an efficient management of the area. The projects outlined give consideration to use of the area by the public and building up of the resources as a source of income to help make the area self-supporting.

(NOTE: CWCA - Central Wisconsin Conservation Area. Approximately 112,000 acres federally-owned and leased to the State of Wisconsin for administration and management under a long term agreement. Custodianship divided about equally, between the U. S. Forest Service and the Fish and Wildlife Service.)

Two interstate projects are incorporated in this proposal. One deals with the natural history of the lake trout of the Great Lakes and the other deals with a survey of the fish resources of the Mississippi River. Both projects are of sufficient importance to have the various states enter into cooperative agreements to proceed with the work.

Our projects listed have No. 1 priority.

b. Fish Propagation and Elimination of Rough Fish

Wisconsin contains over 7,000 lakes and approximately 10,000 miles of trout streams. In normal times these waters are intensely fished by many hundreds of thousands of resident and nonresident fishermen. The choicest game fish are removed from our waters in great numbers each year. Muskellunge, walleyed pike, northern pike, black bass and the various species of trout are the species most desired by fishermen. Various species of panfish are also taken in great numbers. Natural propagation of these species is not sufficient to maintain a high population of these prized game fish in our waters. It is therefore necessary for the state to engage in the artificial propagation of game fish to restock the waters which are being depleted.

The development of rearing ponds in various parts of the state is very important in the propagation of walleyed pike, black bass, muskellunge and trout. Several garages and utility buildings are needed for storage purposes. Streamside planting has proved to be very beneficial to trout streams in the state. The attached program includes the planting of trees and shrubs on the banks of trout streams where such plantings are needed.

The German carp is a very prolific fish and is seldom taken by hook and line fishermen. Consequently, these fish soon take over and destroy the habitat of the better quality game fish if they are not kept under control. The most



satisfactory method of keeping the population of this species of rough fish at a minimum is to remove them by the use of seines and traps.

Our post-war plans include an increase in the facilities for this work. Development of ponds, construction of storage buildings, cleaning of seining areas in lakes and streams and construction of fish traps are important items in this program.

The program submitted includes the requirements of the Wisconsin Conservation Department divisions of fish propagation and contract and commercial fishing.

c. Game Development on Forest, Woodlot and Farm Areas

This plan is based largely upon the restoration of game cover and food, the defining of refuges and public hunting ground boundaries, water restoration, miscellaneous construction and the artificial feeding of deer in winter.

1. To some extent in the northern counties and to a much greater extent in the southern counties, the game division feels that the quickest and most economical way to restore game and fish cover on streambanks, marsh borders, grazed woodlots, fencerows, gullies and in the odd places and corners, is to fence against livestock and let nature take its course. This program should be augmented by some auxiliary planting of native trees or shrubs, particularly those that provide cover throughout the entire year. This program is particularly essential in the southern counties and on both public and private lands. Some experimental fencing is necessary in the north in conjunction with the restoration of white cedar yards and the experimental planting of white cedar.
2. Wisconsin now has in excess of 2,500,000 acres of public hunting land in the northern counties. The boundaries of none of these lands are brushed or posted. With the additional 50¢ increase to the resident hunting license, we expect to acquire by lease or purchase not less than one-half million acres of public hunting grounds in the central and southern counties within a three-year period. It is planned to post the more important northern blocks, to brush a limited number of important refuge lines and to use all available materials and labor in doing a good posting job on the public hunting lands acquired by the state in the central and southern counties.
3. In its water restoration program, the game division has provided for a limited number of dams and some miles of dikes.
4. In the construction program we have asked for ten miscellaneous buildings. Generally these will be used for headquarters or for storage.

5. The Wisconsin legislature has made it mandatory that the conservation department carry on at least limited winter deer feeding operations.

The most economical deer feed is one with a high energy and protein content, preferably made of a combination of corn, oats, alfalfa, molasses, salt, etc. Probably one pound of this concentrate is equal to three pounds of combined alfalfa hay and grain supplement with one-third the bulk. The cost of transporting deer feed to the point of feeding is in many cases so high that the actual cost of transportation equals the cost of the feed. It is, consequently, necessary to transport this feed at the most opportune time and to store it in rodent-proof caches. Trails and rough roads must necessarily be cut to get the feed back where it is to be cached and fed. Suitable rough storage shacks must be constructed, rodent proofed and properly ventilated. Our plan calls for the construction of the necessary roads and trails and for 100 caches as described above to be placed at key points in more inaccessible places in the northern counties.

## 6. Water Utilization and Control in Connection with Forest Lands

It is felt that a sound and well designed water conservation program should have an important place in the development of post-war plans. The problems of water conservation are intimately connected with the problems of land use as affecting forest growth and protection, fish and wild life propagation, recreation, agricultural development and the use of marginal, submarginal and cutover lands.

The program as has been developed in the forest protection areas of Wisconsin included the construction of some two hundred fifteen drainage control dams in drainage ditches and streams of central Wisconsin; the building of about one hundred water conservation dams, used for recreation, fish and game propagation, flood control, fire protection and control; the building of dams, dikes and control structures to create flowages for game and fish propagation, fire protection, flood control and recreation. It is planned to rebuild, enlarge, strengthen and otherwise improve many of these structures as a part of a long range construction program.

The post-war plan includes:

- a. The installation of permanent improvements, enlargements and protecting works in connection with existing drainage control dams;
- b. The cleaning, deepening and enlarging of certain drainage ditches to facilitate the flow of water in order to provide flood protection and improved drainage for adjacent farm lands adjoining those forest and wildlife areas where water conservation is practiced;

c. The replacing of deteriorating timber dams and timber spillways with concrete in order to provide permanent structures;

d. The enlarging, strengthening and rebuilding of earth dikes, earth dams and emergency spillways in order to insure permanence to the flowages which these structures create;

e. The construction of such new dams, dikes and water control structures as are needed to facilitate the program of forest growth and forest protection as well as the propagation of fish and game, and to promote a worthwhile program for land use;

f. And the formation of a plan for long range research projects to study such problems as the effect of ground water elevation on forest growth; the effect of reforestation on soil moisture retention; groundwater levels, runoff and flood magnitude, and to continue studies of the effect upon ground water levels of existing dams, dikes, and flowages, and to apply the information gained to problems of land use, conservation, forest growth and forest protection.

The outline of plans submitted herewith is a joint recommendation of the Conservation Department and the Water Regulatory Board with both agencies cooperating in the development of the program.

## B. Related Measures Essential to Capital Improvements

### 1. Land Acquisition

#### a. State of Wisconsin Forests.

The State of Wisconsin owns eight state forests. With the exception of two which probably have reached their full growth, acquisition is going on in all of them.

The following table presents the situation as it exists today:

| Area              | Gross<br>Acreages<br>Present<br>Boundaries | Escimate<br>of Final<br>State<br>Ownership | Net Acre-<br>ages<br>Present<br>Boundaries | Present<br>State<br>Ownership | Net Acreage<br>to be Purchas-<br>ed or Other-<br>wise Acquired |
|-------------------|--|--|--|-------------------------------|--|
| Northern Highland | 406,562.85                                 | 60%  | 243,938                                    | 126,687                       | 117,251  |
| American Legion   | 90,530.23                                  | 60%  | 54,318                                     | 37,660                        | 16,658   |
| Brule River       | 28,640.00                                  | 80%  | 22,912                                     | 7,759                         | 15,153   |
| Silver Cliff      | 30,720.00                                  | 80%  | 24,576                                     | 800                           | 23,776   |
| Flambeau River    | 92,807.53                                  | 95%  | 88,167                                     | 42,508                        | 45,659   |
| Kettle Moraine    | 46,285.00                                  | 80%  | 37,028                                     | 6,834                         | 30,194   |
|                   | <u>695,545.61</u>                          |  | <u>470,939</u>                             | <u>222,248</u>                | <u>248,691</u>   |



Approximately 250,000 acres will have to be purchased before the program as it exists today may be considered carried out to its full extent.

The state forest acquisition program is financed by appropriations from the forestry mill tax income.

A sum of \$150,000 annually is earmarked for purchases in the Kettle Moraine Forest which has been given high priority by the legislature. Deducting \$25,000 for administration, a sum of \$125,000 is left for acquisition in the Kettle Moraine. Adding to this the sum of \$25,000 annually available for other purchases, we have altogether \$150,000 per year for land purchases in the forests listed above.

Provided there is no radical change, it is assumed that the acquisition program can be concluded within the next twenty years.

#### b. County and Community Forests

In the cutover section of the state, where tax delinquency has been a problem and where about 1,900,000 acres of cutover forest lands that have reverted to the counties have been established as county forests, little purchase of land is contemplated. It is planned to build up the county forests through lands acquired by tax delinquency and reversion to counties. Recently there has been a tendency for counties in the northern portion of the state to sell some of their county forest lands to paper companies. Lands so returned to private ownership will be managed for forestry purposes. Within the past year, approximately 100,000 acres of county forest lands have been disposed of through sale to paper companies.

Some tracts of land in county forests where land use is controlled will have to be purchased in order to get poorly located settlers relocated. There are in the cutover areas of the state 1,619 settlers located on submarginal or extremely isolated tracts of land who should be given an opportunity to locate elsewhere. Approximately 1,000 of these settlers will probably have to be bought out at an average cost to the public of \$1,000 per case. This will require an outlay of \$1,000,000 for land and about \$200,000 for handling the acquisition work.

This type of work has been carried on in the past using both local funds and federal funds under Title III of the Bankhead-Jones Farm Tenant Act.

In the central and southern portions of the state, there are tracts of land which either have been unduly abused and require a considerable outlay of cash to put them back into satisfactory cover or which are so poor they do not contribute an appreciable income to the farm owner. It is not



economically feasible for private land owners to attempt to rehabilitate this type of land or attempt forest management upon it. Soil conservation agencies have estimated approximately 679,000 acres of mistreated or submarginal lands now in farms in the central and southern portions of the state should be retired to public ownership. The approximate cost of this acquisition program would be \$7,500,000.

Lands so acquired would lend themselves admirably for administration as village, township, school, soil conservation district, county, and in some instances, state forests.

#### c. Federal Forests

There are established two national forests in Wisconsin embracing a gross area of 2,017,321 acres. Of this gross area, 1,405,619 acres are now in government ownership. It is estimated 396,921 acres may yet be purchased within the present national forest boundaries. Of this area of 396,921 acres listed as purchaseable, 210,000 acres should be acquired in the first three years immediately following the termination of the war. It is estimated the purchase price of this land to be bought in the three-year period would approximate \$800,000.

The purchase of submarginal or isolated farm tracts within the national forest area would be facilitated by the amendment of Title III of the Bankhead-Jones Farm Tenant Act to permit use of funds under this act to purchase farm lands within the national forest boundaries.

Extension of the national forests in Wisconsin is not contemplated in the early post-war period. Emphasis is to be laid upon consolidation within existing boundaries before any additional federal land acquisition is to be considered outside of established boundaries.

## 2. Cooperative Fire Protection Services

The extension of some fire prevention and fire control assistance to owners of woodlands in the forty-seven central and southern counties lying outside of the intensively protected fire protection districts.

The State Conservation Department contemplates the establishment of a total of twelve cooperative fire protection districts. Five cooperative fire protection districts have been established to date. The establishment of seven additional districts will call for added personnel and equipment.

Under state law, the township chairmen cooperate with the State Conservation Department in suppressing fires under the cooperative fire protection district arrangement. The extension of this arrangement after the war to place the balance of the rural areas

of the state under some form of fire protection is a task having high priority with the Conservation Department.

### 3. Research

#### a. State and County Forests

Contemplated participation with University of Wisconsin and other public agencies in a broad program of forest research primarily on state and county lands but also devoted to forest research in insect and rodent control, forest tree diseases and forest soils on private forest land. Five men--three principal and two assistants employed on year-long basis.

#### b. Farm Woodlands

Relatively little attention has been given to date to studying the problems of the farm woodlot. The Lake States Forest Experiment Station and the Soil Conservation Service have jointly conducted a study related to the relationship of woodlot cover to precipitation runoff. There is a need for studies on farm woodlands related to silvicultural management, utilization of products, pasturing of stock in woodland tracts, operation of woodlots under conditions simulating farm management, and improvement of stands.

The State Extension Forester has suggested the establishment of fifty to seventy state, county or University-owned woodlots of average size to serve as demonstration and experimental forests. These tracts would be located throughout the farm woodlot sections of the state and would constitute the focal point in each district for farm woodland activity.

#### c. Forest Areas

There is urgent immediate need for a study of timber culture measures undertaken during the CCC and other emergency programs. Results of the work done need to be analyzed and the desirability of conducting similar work in the future determined.

Studies in the establishment and care of forest plantations should be resumed and enlarged in scope. Particular attention needs to be given to problems encountered in stand conversion and improvement of forest stands by introduction of more valuable tree species. In this connection, a careful analysis of the work done in forest planting from 1933 to 1940 should be made so that lessons of value in future large scale planting programs might be developed.

A study is needed of changing timber utilization requirements and standards. During the war, many changes in the form of wood utilization have taken place. These should be analyzed in order that forest management practices might be brought up to date.

A survey of war demands upon growing timber in Wisconsin should be made. Measures to rehabilitate the growing stock should be studied and steps recommended to prevent further deterioration.

#### 4. Surveys and Inventories

The "Forest Survey" should be brought up to date with particular emphasis upon available pulpwood supplies, depletion of timber resources as a result of the war, farm woodlot conditions and review of rates of growth and growing stock.

In the state and county forests, there is need for a forest cover type map and forest inventories as an aid to management of these tracts in the future. There are approximately 2,400,000 acres of forest inventory of this type needed.

On national forests, existing cover type maps should be brought up to date and forest inventories revised where warranted. Review and revision of approximately 1,800,000 acres of existing inventories will be required to bring the national forest inventories up to date.

Better base maps are required over much of the cutover areas of the state. At the present time, there is under way a joint project conducted by the U. S. Geological Survey and the Wisconsin Highway Department whereby unmapped portions of the state are being covered by a planimetric survey. The State Highway Department is matching federal funds on this undertaking. Approximately ten million acres of land remain to be mapped in areas where forest lands predominate.

#### 5. Maintenance of Improvements

The work load involved in operating and maintaining the forestry physical improvements has been included in the work load forms forming a part of this report. It is estimated this work will require 272.94 man years of time during the three years immediately following the war for national forest projects alone. No estimate on maintenance work was submitted by the Wisconsin Conservation Department.

### C. Other Measures Needed in a Program of Forest Conservation

#### 1. Educational and Technical Assistance to Private Owners

Some assistance is being furnished to private timberland owners through the U. S. Forest Service and State Conservation Department. Paper companies which are the largest concerns practicing forestry have foresters in their employ. There is need for the employment of additional foresters by the State Conservation Department to assist the owners of forest land to a greater extent than has been the case in the pre-war period. Strengthening of the Conservation Department in this regard will call



for an increased appropriation of funds by the State Legislature for this purpose.

Under the Norris-Doxey Farm Forestry Act, a cooperative farm forest product marketing project is being handled by the State Conservation Department and the U. S. Forest Service in one area. The Soil Conservation Service is sponsoring a similar project in another portion of the state. This type of work has proved extremely worthwhile and should be enlarged to embrace the principal farm woodlot sections of the state.

Within the State Extension Service an Extension Forester is employed. The coverage of one man to the state has been insufficient to meet the problems. The Extension Forester should be provided with several aides so that all of the County Farm Advisors may have available on short call a technical forester. As an additional aid to the educational program, there should be made available to the Extension Division of the University some fifty to seventy farm woodlot demonstration tracts. These tracts should be well spaced through the state and representative of the woodlots in the area in which located. The tracts should be publicly owned, either by the University or by some branch of government. In any event, the University should have control of the management of the tracts. These tracts would be designed to serve as centers for the dissemination of information concerning farm woodlots, both for the woodlot owner and the local county farm agent.

Farmers would be employed to work on the tracts and would gain knowledge as to proper woodlot practices. The objective would be to cause the demonstration tracts to serve the same purpose as do the existing state experimental farms in the field of general agriculture.

The demonstration areas would also serve as the centers for research in the general field of farm woodlot management. Such research would be conducted as a joint project of the College of Agriculture and the Lake States Forest Experiment Station.

The action agencies such as the State Conservation Department, the Soil Conservation Service and the Federal Forest Service, where concerned, would use the demonstration woodlots as the focal points of their activities.

## 2. Assistance in Marketing Forest Products

The marketing problem in Wisconsin is largely confined to the small woodland owner. The larger operators have largely developed their own outlets upon which they can rely.

At the present time, two marketing assistance programs are being carried on. One is an intensive farm-forestry program under direction of the Soil Conservation Service in Vernon County, while the other is an extensive marketing assistance program carried on by the State Conservation Department in the east central counties in collaboration with the U. S. Forest Service.



Elsewhere in the state, the Extension Forester and the Conservation Department have given aid in the organization of farmers' cooperatives for the handling of forest products.

The formation of pools or cooperatives to handle forest products and to operate portable sawmills and milling equipment appears to hold promise for the future and is to be encouraged.

There should be a material increase in the number of farm-forestry projects as well as a strengthening of the existing extensive marketing assistance offered through the Conservation Department.

Given sufficient educational and marketing aid, it is believed the farm woodlots of Wisconsin can be brought to contribute their proportionate and proper share to the income of Wisconsin farmers.

In areas where marketing aid has been given, there has been a marked increase in the appreciation of the place a woodlot may occupy in a farm's economy.

### 3. Benefit Payments for Improved Forest Practices

Current thought in agricultural and conservation circles in Wisconsin is predominantly against benefit payments to the private land owner who follows good forest practices.

The belief is generally held that subsidy of the forest and woodland owner should be limited to:

- a. Distribution of planting stock at cost
- b. Fire protection
- c. Protection against general widespread disease and insect pests
- d. Educational assistance through the Extension Service
- e. Technical assistance in marketing forest products and developing market pools
- f. Benefits of forest research
- g. Technical aid in solving utilization problems such as is offered by the Forest Products Laboratory

There is strong sentiment against expending public funds for the employment of workers to improve privately-owned woodlands through planting, timber culture or fencing, unless the public agency paying for such work is ultimately reimbursed by the timberland owner.

### 4. Long Term Credit for Forestry Operations

- a. Credit for Farmers

Although federal credit is available, no interest has, as yet, been evinced by farmer owners of woodlots in obtaining such credit for forestry operations. When desired, credit

asked for in connection with operation of woodlots is usually in connection with harvesting products of the woodlot. At present, such credit is, in Wisconsin, forthcoming from local sources.

No farmer interest has been shown as yet in long term credit for handling of woodlots. Informed opinion at present believes there will be relatively little demand in the near future for long term credit for the practice of forestry on farm woodlots.

#### b. Credit for Non-Farm Forest Land Owners

In the past, there has been no doubt but that the type of credit obtained by timberland owners has been a factor in liquidating holdings of mature timber in Wisconsin. However, liquidation has run its course and in so far as the small tracts of mature timber left are concerned, the availability of cheap rate, long term credit will not be a factor in determining whether these remnants will be cut according to good forestry practice.

At present, the paper companies entering the forestry field are financing their undertakings without difficulty. It is possible that in the event of a severe financial depression in the future, government credit may be needed by these companies to enable them to carry their forest land holdings without liquidating. As yet, there is no demand for credits to carry on forestry work.

### 5. Tax Reform

Under the Wisconsin Forest Crop Law, progress is apparently being made in the development of forestry programs on privately-owned lands. The law has worked out more satisfactorily in the cutover counties of the state than in the agricultural counties.

In the more highly developed areas, there has been reported a tendency on the part of assessors to transfer to the remaining portions of farms the current tax returns lost through entering the farm woodlot under the forest crop law.

### 6. Cooperative Sustained-Yield Timber Management by Public and Private Owners

There is an urgent need in the immediate post-war period to analyze the potential sources of woodpulp for the Wisconsin paper mills and determine if there should not be established some very definite sustained-yield management areas to insure each mill some local pulpwood on a dependable basis. These must embrace public holdings, paper company lands and other privately-held lands. The raw material supply for the highly concentrated paper industry in Wisconsin constitutes

a very definite and pressing problem in the post-war period.

#### 7. Public Control of Forest Practices on Private Lands

While regulation of forest cutting practices in Wisconsin can do little to prevent the cutting of mature timber, since this is about gone in this state, there is a definite need for some restriction on cutting of the second growth stands.

There is a considerable body of public opinion in Wisconsin favorable to a forest cutting regulatory act. In the last state legislature such an act was advanced and while failing of passage, gained much favorable comment.

Sentiment in the state among informed persons favors the enactment of a state law, rather than placing dependence upon the passage of a federal regulatory act.

#### 8. Additional Measures

The problems of forestry and forest land use, especially in the cutover areas of northern Wisconsin, are inextricably woven into the entire economic pattern of this northern part of the state. These inter-related problems have been well presented in the bulletin of the National Resources Committee entitled "Regional Planning, Part VIII - Northern Lake States" and issued in May, 1939. This publication represented the work and recommendations of the Northern Lake States Regional Committee.

One of the recommendations of this Committee was that a Regional Coordinating Committee be maintained to study, advise and develop methods whereby the forest land problems common to Wisconsin, Michigan and Minnesota might be jointly handled. Such a recommendation has merit as a post-war project.

#### Acknowledgement

This report as prepared for the State of Wisconsin, represents a joint effort participated in by Mr. Fred Trenk, Extension Forester of the Extension Division of the University of Wisconsin; Director E. C. Vanderwall, Associate Director Ernest Swift, Area Supervisor H. T. J. Cramer, and other members of the Wisconsin Conservation Department, and members of the United States Forest Service. The report of the Soil Conservation Service dealing with Crop and Pastureland was also drawn upon for some statistics concerning farm woodlands.

The report as finally written, while embracing material submitted by a number of individuals, has never been reviewed in its entirety by all participants in its preparation. To the best knowledge of the Editor, however, it represents the substance of current opinion among technicians now engaged in the practice of forest, woodland, game and fish management in the State of Wisconsin.

The assistance of the many men in State and Federal Services who have aided in compiling work load estimates, preparing written statements or suggesting measures to be taken, all in spite of heavy current duties, is appreciated.

WARREN T. MURPHY  
For the Midwest Sub-Committee  
on Forest and Woodlands

WTMurphy:BR



CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement Protection Against Fire State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |                    | Fire Equip.<br>Lisc. | Totals           |
|---|----------|---------------------------|--------------------|----------------------|------------------|
|   |          | Hazard<br>Reduction       | Improvements       |                      |                  |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |                    |                      |                  |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   | 2980A<br>6986A            | 29 Proj.<br>14 "   | 16 Proj.             | x x x            |
| (b) On Government Land -<br>Other Federal                           |          |                           |                    |                      |                  |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 763A<br>2000A             | 5.7 Proj.<br>183 " | 5902 Hacks<br>351 "  |                  |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |                    |                      |                  |
| (e) On Private Land -<br>Other                                      |          |                           |                    |                      |                  |
| (f) Totals  |          | 9966A                     | 43 Proj.           | 16 Proj.             | x x x            |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |                    |                      |                  |
| (a) On Federal Gov't Land   |          | 90%                       | 68%                | 81%                  |                  |
| (b) On State & Local Gov't<br>Land                                  |          | 90%                       | 65%                | 61%                  |                  |
| (c) On Private Lands  |          |                           |                    |                      |                  |
| (d) On All Land   |          | 90%                       | 65%                | 81%                  |                  |
| 3. <u>Employment (man years)</u>                                    |          |                           |                    |                      |                  |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   | 78.35<br>387.81           | 38.74<br>12.48     | 7.68                 | 124.77<br>400.29 |
| (b) On Government Land -<br>Other Federal                           |          |                           |                    |                      |                  |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 40<br>106                 | 672<br>317         | 425<br>308           | 1147<br>621      |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |                    |                      |                  |
| (e) On Private Land - Other   |          |                           |                    |                      |                  |
| (f) Total   |          | 612.16                    | 1040.22            | 840.68               | 2493.06          |

\* Priority.

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.

115 Pieces of Fire Equipment Needed. (Fed'l)



CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement Timber Development & Watershed Protection State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |                   |                     | Totals   |
|---|----------|---------------------------|-------------------|---------------------|----------|
|   |          | Planting                  | Stand Improvement | Fencing of Woodlots |          |
| 1. Amounts (Acres, miles, etc.)                                 |          |                           |                   |                     |          |
| (a) On Gov't Land, Dept. of Agriculture                         | 1        | 12333A                    | 23000A            |                     |          |
|   | 2        | 31532A                    | 57000A            |                     |          |
| (b) On Government Land - Other Federal                          |          |                           |                   |                     |          |
| (c) On Public Land - State and Local                            | 1        | 100,600                   | 140,000           |                     |          |
|   | 2        | 302,000                   |                   |                     |          |
| (d) On Private Land - Farm Woodlands                            |          | 133,000A                  | 206,000A          | 15,000 1/2          |          |
| (e) On Private Land - Other                                     |          |                           |                   |                     |          |
| (f) Totals  |          | 578,865A                  | 436,000A          | 15,000 1/2          |          |
| 2. <u>Ratio of Labor Cost to Total Cost (Estimated Percent)</u> |          |                           |                   |                     |          |
| (a) On Federal Gov't Land                                       |          | 87%                       | 92%               |                     |          |
| (b) On State & Local Gov't Land                                 |          | 80%                       | 90%               |                     |          |
| (c) On Private Lands  |          | 85%                       | 95%               | 70%                 |          |
| (d) On All Land   |          | 84%                       | 92%               | 70%                 |          |
| 3. <u>Employment (man years)</u>                                |          |                           |                   |                     |          |
| (a) On Government Land - Dept. of Agriculture                   | 1        | 368.20                    | 184.50            |                     | 552.70   |
|   | 2        | 551.65                    | 536.50            |                     | 1088.15  |
| (b) On Government Land - Other Federal                          |          |                           |                   |                     |          |
| (c) On Public Land - State and Local                            | 1        | 835                       | 1870              |                     | 2705     |
|   | 2        | 2515                      |                   |                     | 2515     |
| (d) On Private Lands - Farm Woodlands                           |          | 1,064                     | 824               | 600                 | 2,488    |
| (e) On Private Land - Other                                     |          |                           |                   |                     |          |
| (f) Total   |          | 5,333.85                  | 3,415.00          | 600                 | 9,348.85 |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





USDA

Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Upstream Flood Control Improvements State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |                     |  | Enlarging<br>Rebuilding<br>Totals           |
|---|----------|---------------------------|---------------------|--|---|
|   |          | Drainage<br>Control Dams  | Drainage<br>Ditches | Replacing Timber<br>Dams with concrete | Spillways                                   |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |                     |  |   |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   |                           |                     |  |   |
| (b) On Government Land -<br>Other Federal                           |          |                           |                     |  |   |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 100 dams<br>115 "         | 115 miles           | 30 dams                                | 20 mi. spillways<br>30 spillways<br>15 dams |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |                     |  |   |
| (e) On Private Land -<br>Other                                      |          |                           |                     |  |   |
| (f) Totals  |          | 215 dams                  | 115 miles           | 30 dams                                |   |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |                     |  |   |
| (a) On Federal Gov't Land   |          |                           |                     |  |   |
| (b) On State & Local Gov't<br>Land                                  |          | 50%                       | 40%                 | 60%                                    | 50%   |
| (c) On Private Lands  |          |                           |                     |  |   |
| (d) On All Land   |          |                           |                     |  |   |
| 3. <u>Employment (man years)</u>                                    |          |                           |                     |  |   |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   |                           |                     |  |   |
| (b) On Government Land -<br>Other Federal                           |          |                           |                     |  |   |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 19<br>22                  | 22                  | 75                                     | 82<br>30                                    |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |                     |  |   |
| (e) On Private Land - Other   |          |                           |                     |  |   |
| (f) Total   |          | 41                        | 22                  | 75                                     | 112   |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.



CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement \_\_\_\_\_ State \_\_\_\_\_

|   | *<br>Pr. | Subclasses of Improvement |                |     | Totals |
|---|----------|---------------------------|----------------|-----|--------|
|   |          | New Lands &<br>Dikes      | Research Proj. |     |        |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |                |     |        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   |                           |                |     |        |
| (b) On Government Land -<br>Other Federal                           |          |                           |                |     |        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 50 proj.                  | 6 proj.        |     |        |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |                |     |        |
| (e) On Private Land -<br>Other                                      |          |                           |                |     |        |
| (f) Totals  |          | 50 proj.                  | 6 proj.        |     |        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |                |     |        |
| (a) On Federal Gov't Land   |          |                           |                |     |        |
| (b) On State & Local Gov't<br>Land                                  |          | 50%                       | 80%            |     |        |
| (c) On Private Lands  |          |                           |                |     |        |
| (d) On All Land   |          |                           |                |     |        |
| 3. <u>Employment (man years)</u>                                    |          |                           |                |     |        |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   |                           |                |     |        |
| (b) On Government Land -<br>Other Federal                           |          |                           |                |     |        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   | 200                       | 30             | 321 | 710    |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |                |     |        |
| (e) On Private Land - Other   |          |                           |                |     |        |
| (f) Total   |          | 200                       | 30             |     | 710    |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement General Research State Wisconsin

|   | *<br>Pr | Subclasses of Improvement |            |  | Totals |
|---|---------|---------------------------|------------|--|--------|
| 1. Amounts (Acres, miles, etc.)                                     |         |                           | Fisheries  |  |        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2  | 15 proj.                  |            |  |        |
| (b) On Government Land -<br>Other Federal                           |         |                           |            |  |        |
| (c) On Public Land - State<br>and Local                             | 1<br>2  |                           | State wide |  |        |
| (d) On Private Land - Farm<br>Woodlands                             |         |                           |            |  |        |
| (e) On Private Land -<br>Other                                      |         |                           |            |  |        |
| (f) Totals  |         | 15 proj.                  |            |  |        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |         |                           |            |  |        |
| (a) On Federal Gov't Land   |         | 72%                       |            |  |        |
| (b) On State & Local Gov't<br>Land                                  |         |                           | 85%        |  |        |
| (c) On Private Lands  |         |                           |            |  |        |
| (d) On All Land   |         | 72%                       |            |  |        |
| 3. <u>Employment (man years)</u>                                    |         |                           |            |  |        |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2  | 5.96                      |            |  |        |
| (b) On Government Land -<br>Other Federal                           |         |                           |            |  |        |
| (c) On Public Land - State<br>and Local                             | 1<br>2  |                           | 5215       |  |        |
| (d) On Private Lands -<br>Farm Woodlands                            |         |                           |            |  |        |
| (e) On Private Land - Other   |         |                           |            |  |        |
| (f) Total   |         | 5.96                      | 5215       |  |        |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.



## USDA

## Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDForestClass of Improvement Wildlife Development State Wisconsin

|   | *<br>Pr | Subclasses of Improvement       |                                   |          | Totals |
|---|---------|---------------------------------|-----------------------------------|----------|--------|
|   |         | Surveys & Improvements<br>Plans | Improvement of<br>Streams & Roads |          |        |
| 1. Amounts (Acres, miles, etc.)                                     |         |                                 |                                   |          |        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1       | 30 Proj.                        | 14 proj.                          |          |        |
|   | 2       | 24 "                            | 97 "                              |          |        |
| (b) On Government Land -<br>Other Federal                           |         |                                 |                                   |          |        |
| (c) On Public Land - State<br>and Local                             | 1       |                                 | 171 proj.                         | 1000 mi. |        |
|   | 2       |                                 | 50 "                              |          |        |
| (d) On Private Land - Farm<br>Woodlands                             |         |                                 |                                   | 200 mi.  |        |
| (e) On Private Land -<br>Other                                      |         |                                 | 75 proj.                          | 850 "    |        |
| (f) Totals  |         | 54 proj.                        | 407 proj.                         | 2050 mi. |        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |         |                                 |                                   |          |        |
| (a) On Federal Gov't Land   |         | 81%                             | 87%                               |          | x x x  |
| (b) On State & Local Gov't<br>Land                                  |         |                                 | 67%                               | 70%      |        |
| (c) On Private Lands  |         |                                 | 80%                               | 42%      |        |
| (d) On All Land   |         | 81%                             | 78%                               | 56%      | x x x  |
| 3. <u>Employment (man years)</u>                                    |         |                                 |                                   |          |        |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1       | 32.65                           | 49.17                             |          | 81.76  |
|   | 2       | 53.57                           | 420.50                            |          | 464.07 |
| (b) On Government Land -<br>Other Federal                           |         |                                 |                                   |          |        |
| (c) On Public Land - State<br>and Local                             | 1       |                                 | 855                               | 240      | 1095   |
|   | 2       |                                 |                                   |          |        |
| (d) On Private Lands -<br>Farm Woodlands                            |         |                                 |                                   | 27       |        |
| (e) On Private Land - Other   |         |                                 | 7231                              | 282      |        |
| (f) Total   |         | 96.22                           | 8,555.61                          | 556      |        |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement Insect & Disease Control State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |                        |                        | Improvement<br>Totals  |
|---|----------|---------------------------|------------------------|------------------------|------------------------|
|   |          | Insect                    | Disease                | Rodent Control         |                        |
| 1. Amounts (Acres, miles, etc.)                             |          |                           |                        |                        |                        |
| (a) On Gov't Land, Dept.<br>of Agriculture                  | 1<br>2   | 3135A<br>2340A            | 10,227A<br>13,050A     |                        |                        |
| (b) On Government Land -<br>Other Federal                   |          |                           |                        |                        |                        |
| (c) On Public Land - State<br>and Local                     | 1<br>2   | 2,000,000<br>4,000,000    | 2,000,000<br>4,000,000 | 2,000,000<br>4,000,000 | 117 prop.<br>161 prop. |
| (d) On Private Land - Farm<br>Woodlands                     |          | 10,000,000                | 10,000,000             | 10,000,000             |                        |
| (e) On Private Land -<br>Other                              |          |                           |                        |                        |                        |
| (f) Totals  |          | 16,005,525A               | 16,023,277A            | 16,000,000A            | 278 prop.              |
| 2. Ratio of Labor Cost to Total<br>Cost (Estimated Percent) |          |                           |                        |                        |                        |
| (a) On Federal Gov't Land                                   |          | 78%                       | 84%                    |                        |                        |
| (b) On State & Local Gov't<br>Land                          |          | 75%                       | 75%                    | 75%                    | 75%                    |
| (c) On Private Lands  |          | 85%                       | 85%                    | 85%                    |                        |
| (d) On All Land   |          | 79%                       | 81%                    | 80%                    | 75%                    |
| 3. Employment (man years)                                   |          |                           |                        |                        | TOTAL                  |
| (a) On Government Land -<br>Dept. of Agriculture            | 1<br>2   | 5.80<br>5.06              | 18.95<br>23.04         |                        | 28.75<br>38.10         |
| (b) On Government Land -<br>Other Federal                   |          |                           |                        |                        |                        |
| (c) On Public Land - State<br>and Local                     | 1<br>2   | 60<br>17                  | 60<br>17               | 60<br>18               |                        |
| (d) On Private Lands -<br>Farm Woodlands                    |          | 5                         | 5                      | 5                      |                        |
| (e) On Private Land - Other                                 |          |                           |                        |                        |                        |
| (f) Total   |          | 10.86                     | 123.99                 | 83                     |                        |

\* Priority

- #1 - Necessary work to continue during prosperity as well as depression.  
#2 - Desirable work reserved for unemployment relief programs.



## CAPITAL IMPROVEMENTS FOR FOREST LAND

Forest

Class of Improvement

Recreational Development

State

Wisconsin

|   | *<br>Pr. | Subclasses of Improvement<br><u>Surveys and Improvements</u> |                  |  | Totals            |
|---|----------|--|------------------|--|-------------------|
| 1. Amounts (Acres, miles, etc.)                                     |          | Plans  |                  |  |                   |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   | 26 proj.<br>97 "   | 19 proj.<br>85 " |  | 45 proj.<br>182 " |
| (b) On Government Land -<br>Other Federal                           |          |  |                  |  |                   |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |  |                  |  |                   |
| (d) On Private Land - Farm<br>Woodlands                             |          |  |                  |  |                   |
| (e) On Private Land -<br>Other                                      |          |  |                  |  |                   |
| (f) Totals  |          | 123 proj.  | 104 proj.        |  | 227 proj.         |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |  |                  |  |                   |
| (a) On Federal Gov't Land   |          | 87%  | 75%              |  | XXX               |
| (b) On State & Local Gov't<br>Land                                  |          |  |                  |  |                   |
| (c) On Private Lands  |          |  |                  |  |                   |
| (d) On All Land   |          | 87%  | 75%              |  | XXX               |
| 3. <u>Employment (man years)</u>                                    |          |  |                  |  |                   |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   | 5.62<br>28.10  | 52.34<br>256.45  |  | 61.96<br>284.55   |
| (b) On Government Land -<br>Other Federal                           |          |  |                  |  |                   |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |  |                  |  |                   |
| (d) On Private Lands -<br>Farm Woodlands                            |          |  |                  |  |                   |
| (e) On Private Land - Other   |          |  |                  |  |                   |
| (f) Total   |          | 33.72  | 308.79           |  | 342.51            |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





USDA

Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Land Acquisition State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |                     |                              | Totals |
|---|----------|---------------------------|---------------------|------------------------------|--------|
|   |          | Examination               | Abstracting<br>etc. | Disc. - Edy.<br>posting etc. |        |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |                     |                              |        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1        | 222,000                   | 210,000             | 1,211 Miles                  |        |
|   | 2        | 45,000                    |                     |                              |        |
| (b) On Government Land -<br>Other Federal                           |          |                           |                     |                              |        |
| (c) On Public Land - State<br>and Local                             | 1        |                           |                     |                              |        |
|   | 2        |                           |                     |                              |        |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |                     |                              |        |
| (e) On Private Land -<br>Other                                      |          |                           |                     |                              |        |
| (f) Totals  |          | 267,000                   | 210,000             | 1,211 Miles                  |        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |                     |                              |        |
| (a) On Federal Gov't Land   |          | 85%                       | 86%                 | 78%                          |        |
| (b) On State & Local Gov't<br>Land                                  |          |                           |                     |                              |        |
| (c) On Private Lands  |          |                           |                     |                              |        |
| (d) On All Land   |          | 85%                       | 86%                 | 78%                          |        |
| 3. <u>Employment (man years)</u>                                    |          |                           |                     |                              |        |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1        | 20.98                     | 35.50               | 5.10                         |        |
|   | 2        | 2.86                      |                     |                              |        |
| (b) On Government Land -<br>Other Federal                           |          |                           |                     |                              |        |
| (c) On Public Land - State<br>and Local                             | 1        |                           |                     |                              |        |
|   | 2        |                           |                     |                              |        |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |                     |                              |        |
| (e) On Private Land - Other   |          |                           |                     |                              |        |
| (f) Total   |          | 23.84                     | 35.50               | 5.10                         |        |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.



CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement General Administration State Wisconsin

|  | *<br>Pr. | Subclasses of Improvement |              |                | Totals |
|--|----------|---------------------------|--------------|----------------|--------|
|  |          | Roads                     | Improvements | Communications |        |
| 1. Amounts (Acres, miles, etc.)                          |          |                           |              |                |        |
| (a) On Gov't Land, Dept. of Agriculture                  | 1        | 363 Mi.                   | 16 proj.     | 215 Mi.        | x x x  |
|  | 2        | 1705 Mi.                  | 4 proj.      | 39 Mi.         | x x x  |
| (b) On Government Land - Other Federal                   |          |                           |              |                |        |
| (c) On Public Land - State and Local                     | 1        |                           |              |                |        |
|  | 2        |                           |              |                |        |
| (d) On Private Land - Farm Woodlands                     |          |                           |              |                |        |
| (e) On Private Land - Other                              |          |                           |              |                |        |
| (f) Totals   |          | 2068 Mi.                  | 20 proj.     | 254 Mi.        | x x x  |
| 2. Ratio of Labor Cost to Total Cost (Estimated Percent) |          |                           |              |                |        |
| (a) On Federal Gov't Land                                |          | 64%                       | 67%          | 67%            | x x x  |
| (b) On State & Local Gov't Land                          |          |                           |              |                |        |
| (c) On Private Lands                                     |          |                           |              |                |        |
| (d) On All Land  |          | 64%                       | 67%          | 67%            | x x x  |
| 3. Employment (man years)                                |          |                           |              |                |        |
| (a) On Government Land - Dept. of Agriculture            | 1        | 231.18                    | 23.78        | 34.32          | 289.28 |
|  | 2        | 705.61                    | 7.81         | 7.48           | 720.90 |
| (b) On Government Land - Other Federal                   |          |                           |              |                |        |
| (c) On Public Land - State and Local                     | 1        |                           |              |                |        |
|  | 2        |                           |              |                |        |
| (d) On Private Lands - Farm Woodlands                    |          |                           |              |                |        |
| (e) On Private Land - Other                              |          |                           |              |                |        |
| (f) Total  |          | 936.79                    | 31.59        | 41.80          |        |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





## Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement SurveysState Wisconsin

|  | * | Subclasses of Improvement |             |          | Totals   |
|--|---|---------------------------|-------------|----------|----------|
|  |   | Pr.                       | Retracement | Misc.    |          |
| 1. Amounts (Acres, miles, etc.)                          |   |                           |             |          |          |
| (a) On Gov't Land, Dept. of Agriculture                  | 1 |                           |             | 7 proj.  | 7 proj.  |
|  | 2 | 48 proj.                  |             | 4 proj.  | 52 proj. |
| (b) On Government Land - Other Federal                   |   |                           |             |          |          |
| (c) On Public Land - State and Local                     | 1 |                           |             |          |          |
|  | 2 |                           |             |          |          |
| (d) On Private Land - Farm Woodlands                     |   |                           |             |          |          |
| (e) On Private Land - Other                              |   |                           |             |          |          |
| (f) Totals   |   | 48 proj.                  |             | 11 proj. | 59 proj. |
| 2. Ratio of Labor Cost to Total Cost (Estimated Percent) |   |                           |             |          |          |
| (a) On Federal Gov't Land                                |   | 85%                       |             | 90%      | x x x    |
| (b) On State & Local Gov't Land                          |   |                           |             |          |          |
| (c) On Private Lands                                     |   |                           |             |          |          |
| (d) On All Land  |   | 85%                       |             | 90%      | x x x    |
| 3. Employment (man years)                                |   |                           |             |          |          |
| (a) On Government Land - Dept. of Agriculture            | 1 |                           |             | 7.71     | 7.71     |
|  | 2 | 86.40                     |             | 24.19    | 110.59   |
| (b) On Government Land - Other Federal                   |   |                           |             |          |          |
| (c) On Public Land - State and Local                     | 1 |                           |             |          |          |
|  | 2 |                           |             |          |          |
| (d) On Private Lands - Farm Woodlands                    |   |                           |             |          |          |
| (e) On Private Land - Other                              |   |                           |             |          |          |
| (f) Total  |   | 86.40                     |             | 31.90    |          |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.



CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Maintenance of Improvements State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |              |           | Totals                 |
|---|----------|---------------------------|--------------|-----------|------------------------|
|   |          | Fire                      | Timber Mgmt. | Wild-Life |                        |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |              |           |                        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   | 25 Proj.                  | 2 Proj.      | 4 Proj.   | XXX                    |
| (b) On Government Land -<br>Other Federal                           |          |                           |              |           |                        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |                           |              |           |                        |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |              |           |                        |
| (e) On Private Land -<br>Other                                      |          |                           |              |           |                        |
| (f) Totals  |          | 25 Proj.                  | 2 Proj.      | 4 Proj.   |                        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |              |           | See Sheet 3 for Totals |
| (a) On Federal Gov't Land   |          | 69%                       | 93%          | 75%       |                        |
| (b) On State & Local Gov't<br>Land                                  |          |                           |              |           |                        |
| (c) On Private Lands  |          |                           |              |           |                        |
| (d) On All Land   |          | 69%                       | 93%          | 75%       |                        |
| 3. <u>Employment (man years)</u>                                    |          |                           |              |           | See Sheet 3 for Totals |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   | 14.23                     | 12.46        | 18.00     |                        |
| (b) On Government Land -<br>Other Federal                           |          |                           |              |           |                        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |                           |              |           |                        |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |              |           |                        |
| (e) On Private Land - Other   |          |                           |              |           |                        |
| (f) Total   |          | 14.23                     | 12.46        | 18.00     |                        |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





CAPITAL IMPROVEMENTS FOR FOREST LAND

Class of Improvement Maintenance of Improvements State Wisconsin

|   | *<br>Pr | Subclasses of Improvement |              |                        | Totals |
|---|---------|---------------------------|--------------|------------------------|--------|
|   |         | <u>Recreation</u>         | <u>Lands</u> | <u>Imp. &amp; Rds.</u> |        |
| 1. Amounts (Acres, miles, etc.)                             |         |                           |              |                        |        |
| (a) On Gov't Land, Dept.<br>of Agriculture                  | 1<br>2  | 135 Proj.                 | 1 Proj.      | XXX                    |        |
| (b) On Government Land -<br>Other Federal                   |         |                           |              |                        |        |
| (c) On Public Land - State<br>and Local                     | 1<br>2  |                           |              |                        |        |
| (d) On Private Land - Farm<br>Woodlands                     |         |                           |              |                        |        |
| (e) On Private Land -<br>Other                              |         |                           |              |                        |        |
| (f) Totals  |         | 135 Proj.                 | 1 Proj.      | XXX                    |        |
| 2. Ratio of Labor Cost to Total<br>Cost (Estimated Percent) |         |                           |              |                        |        |
| (a) On Federal Gov't Land                                   |         | 69%                       | 56%          | 68%                    |        |
| (b) On State & Local Gov't<br>Land                          |         |                           |              |                        |        |
| (c) On Private Lands  |         |                           |              |                        |        |
| (d) On All Land   |         | 69%                       | 56%          | 68%                    |        |
| 3. Employment (man years)                                   |         |                           |              |                        |        |
| (a) On Government Land -<br>Dept. of Agriculture            | 1<br>2  | 30.45                     | 3.60         | 177.02                 |        |
| (b) On Government Land -<br>Other Federal                   |         |                           |              |                        |        |
| (c) On Public Land - State<br>and Local                     | 1<br>2  |                           |              |                        |        |
| (d) On Private Lands -<br>Farm Woodlands                    |         |                           |              |                        |        |
| (e) On Private Land - Other                                 |         |                           |              |                        |        |
| (f) Total   |         | 30.45                     | 3.60         | 177.02                 |        |

\* Priority

- #1 - Necessary work to continue during prosperity as well as depression.  
#2 - Desirable work reserved for unemployment relief programs.



USDA

Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Maintenance of Improvements State Wisconsin

|   | *<br>Pr | Subclasses of Improvement |  |  | Totals                |
|---|---------|---------------------------|--|--|-----------------------|
| 1. Amounts (Acres, miles, etc.)                             |         | Telo. Radio               |  |  |                       |
| (a) On Gov't Land, Dept.<br>of Agriculture                  | 1<br>2  | 332 Mi. 15                |  |  | XXX                   |
| (b) On Government Land -<br>Other Federal                   |         |                           |  |  |                       |
| (c) On Public Land - State<br>and Local                     | 1<br>2  |                           |  |  |                       |
| (d) On Private Land - Farm<br>Woodlands                     |         |                           |  |  |                       |
| (e) On Private Land -<br>Other                              |         |                           |  |  |                       |
| (f) Totals  |         | Telo. Radio<br>332 Mi. 15 |  |  | XXX                   |
| 2. Ratio of Labor Cost to Total<br>Cost (Estimated Percent) |         |                           |  |  |                       |
| (a) On Federal Gov't Land                                   |         | 84%                       |  |  | XXX                   |
| (b) On State & Local Gov't<br>Land                          |         |                           |  |  |                       |
| (c) On Private Lands  |         |                           |  |  |                       |
| (d) On All Land   |         | 84%                       |  |  | XXX                   |
| 3. Employment (man years)                                   |         |                           |  |  |                       |
| (a) On Government Land -<br>Dept. of Agriculture            | 1<br>2  | 17.18                     |  |  | Grand Total<br>272.94 |
| (b) On Government Land -<br>Other Federal                   |         |                           |  |  |                       |
| (c) On Public Land - State<br>and Local                     | 1<br>2  |                           |  |  |                       |
| (d) On Private Lands -<br>Farm Woodlands                    |         |                           |  |  |                       |
| (e) On Private Land - Other                                 |         |                           |  |  |                       |
| (f) Total   |         | 17.18                     |  |  |                       |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





## Post War Plans

(Form 1-FL-R9 Modification

For Report of 2/29/44)

CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Operating Projects State Wisconsin

|   | *<br>Pr. | Subclasses of Improvement |              |            | Totals                 |
|---|----------|---------------------------|--------------|------------|------------------------|
|   |          | Fire Con-<br>trol         | Timber Mgmt. | Recreation |                        |
| 1. Amounts (Acres, miles, etc.)                                     |          |                           |              |            |                        |
| (a) On Gov't Land, Dept.<br>of Agriculture                          | 1<br>2   | 27 Proj.                  | 7 Proj.      | 21 Proj.   |                        |
| (b) On Government Land -<br>Other Federal                           |          |                           |              |            |                        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |                           |              |            |                        |
| (d) On Private Land - Farm<br>Woodlands                             |          |                           |              |            |                        |
| (e) On Private Land -<br>Other                                      |          |                           |              |            |                        |
| (f) Totals  |          | 27 Proj.                  | 7 Proj.      | 21 Proj.   |                        |
| 2. <u>Ratio of Labor Cost to Total<br/>Cost (Estimated Percent)</u> |          |                           |              |            |                        |
| (a) On Federal Gov't Land   |          | 85%                       | 92%          | 85%        | See Sheet 2 for Totals |
| (b) On State & Local Gov't<br>Land                                  |          |                           |              |            |                        |
| (c) On Private Lands  |          |                           |              |            |                        |
| (d) On All Land   |          | 85%                       | 92%          | 85%        |                        |
| 3. <u>Employment (man years)</u>                                    |          |                           |              |            |                        |
| (a) On Government Land -<br>Dept. of Agriculture                    | 1<br>2   | 99.89                     | 22.32        | 29.40      |                        |
| (b) On Government Land -<br>Other Federal                           |          |                           |              |            |                        |
| (c) On Public Land - State<br>and Local                             | 1<br>2   |                           |              |            |                        |
| (d) On Private Lands -<br>Farm Woodlands                            |          |                           |              |            |                        |
| (e) On Private Land - Other   |          |                           |              |            |                        |
| (f) Total   |          | 99.89                     | 22.32        | 29.40      |                        |

## \* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.



CAPITAL IMPROVEMENTS FOR FOREST LANDClass of Improvement Operating ProjectsState Wisconsin

|   | *  | Subclasses of Improvement |  |  | Totals      |
|---|----|---------------------------|--|--|-------------|
|   | Pr | Admin                     |  |  |             |
| 1. Amounts (Acres, miles, etc.)                                 |    |                           |  |  |             |
| (a) On Gov't Land, Dept. of Agriculture                         | 1  | 3 Proj.                   |  |  | 61 Proj.    |
|   | 2  |                           |  |  |             |
| (b) On Government Land - Other Federal                          |    |                           |  |  |             |
| (c) On Public Land - State and Local                            | 1  |                           |  |  |             |
|   | 2  |                           |  |  |             |
| (d) On Private Land - Farm Woodlands                            |    |                           |  |  |             |
| (e) On Private Land - Other                                     |    |                           |  |  |             |
| (f) Totals  |    | 6 Proj.                   |  |  | 61 Proj.    |
| 2. <u>Ratio of Labor Cost to Total Cost (Estimated Percent)</u> |    |                           |  |  |             |
| (a) On Federal Gov't Land                                       |    | 96%                       |  |  | XXX         |
| (b) On State & Local Gov't Land                                 |    |                           |  |  |             |
| (c) On Private Lands  |    |                           |  |  |             |
| (d) On All Land   |    | 96%                       |  |  | XXX         |
| 3. <u>Employment (man years)</u>                                |    |                           |  |  | Grand Total |
| (a) On Government Land - Dept. of Agriculture                   | 1  | 64.44                     |  |  | 318.27      |
|   | 2  |                           |  |  |             |
| (b) On Government Land - Other Federal                          |    |                           |  |  |             |
| (c) On Public Land - State and Local                            | 1  |                           |  |  |             |
|   | 2  |                           |  |  |             |
| (d) On Private Lands - Farm Woodlands                           |    |                           |  |  |             |
| (e) On Private Land - Other                                     |    |                           |  |  |             |
| (f) Total   |    | 64.44                     |  |  | 318.27      |

\* Priority

#1 - Necessary work to continue during prosperity as well as depression.

#2 - Desirable work reserved for unemployment relief programs.





### III. ADJUSTMENTS IN AGRICULTURE DURING THE DEMOBILIZATION PERIOD

The following assumed conditions were taken as a basis for making the estimates which follow: (1) The war in Europe will end during 1944. (2) The war with Japan will be concluded by the end of 1945. (3) An initial demobilization of a significant minor fraction of the Army will take place in the first 6 months after the end in Europe. The Navy will still be expanding. Further demobilization will not follow until after the end with Japan, but will then proceed rapidly. By the close of 1946 the military establishment will be approaching a continuing peacetime level, but will still comprise a large force in all branches of the services. (4) The heaviest load of supplemental food relief will come in the first 6 months after the end of the war in Europe. The year of greatest relief shipments will be 1945. By 1946, European relief will be at a much lower level, but this will be offset in part by Asiatic relief and by resumption of normally financed international trade in farm products. (5) Domestic demand during 1945 and 1946 in the United States will remain at a high level and effective demand will be even higher than during wartime as some of the wartime controls begin to be relaxed. (6) By 1946, particularly in the latter half of the year, the world fats and oils situation may ease somewhat. This prospect would permit a slight reduction in 1945 acreage of oil crops in the United States.

#### Crops

In an effort to keep abreast of their need for feed, Wisconsin farmers may be expected to increase corn acreage well above the 1943 levels. They are aware of the fact that corn and alfalfa are their highest producing feed crops, hence no special program is likely to be needed to obtain the acreage increases in corn.

Pressure on small grain acreage is likely to be severe to provide the acres for increases in corn and to provide for the maintenance of hay and pasture acreage. Further swing to vicland oats tends to increase the acreage of this grain, largely at the expense of barley.

The acreage of soybeans in the State will depend partly on the condition of alfalfa and clover hay fields. It is unlikely that the acreage of soybeans for beans will increase much but this crop may be grown extensively for hay if other legume hays should fail.

Little change may be expected in the commercial vegetables and potato crops although some decrease from recent high levels in potatoes may be a strong possibility.

#### Livestock and Livestock Products

Milk production is unlikely to meet the insistent growing demands of Government agencies unless some definite, positive, and popular program can be devised to stimulate lagging production. With normal weather and hence normal pasture and hay crops, Wisconsin farmers will experience considerable shortage in feed supplies to maintain production of recent years to say nothing of furnishing increases beyond present levels. With a return of normal weather is likely to come a curtailment from present levels of milk cow numbers as well as a further decrease in milk production per cow.

In keeping with the general trend, hog production is likely to fall in Wisconsin. The extent of liquidation of sows will depend largely upon what happens in the dairy field. Conditions have been such that hog production has been relatively profitable and hence some of the expansion in the field of livestock in Wisconsin has been in the form of hogs rather than additions to the milk cow numbers.

Estimates of use of cropland, 1945 with comparisons  
Wisconsin

| Use of cropland   | : Acreage   | : Reported: for 1943: | 1944 goals | : 1945   |
|---|-------------|-----------------------|------------|----------|
|   |             | 1/                    | 2/         | 3/       |
|   | 1           | 2                     | 3          | 4        |
|   |             | 1,000                 | 1,000      | 1,000    |
|   |             | acres                 | acres      | acres    |
| Corn, all   | : Planted   | : 2,528               | : 2,625    | : 2,650  |
| Grain sorghums, all                                       | : do.       | : 4                   | : 4        | : 4      |
| Soybeans, grown alone                                     | : do.       | : 112                 | : 100      | : 100    |
| Soybeans for beans  | : Harvested | : 68                  |            | : 70     |
| Tobacco, all  | : do.       | : 17.8                | : 18.2     | : 19     |
| Sugar beets   | : Planted   | : 11.3                | : 17       | : 15     |
| Irish potatoes  | : do.       | : 190                 | : 205      | : 195    |
| Beans, dry edible   | : do.       | : 7                   | : 10       | : 8      |
| Processing vegetables, Total 4/                           | : do.       | : 284                 | : 288.9    | : 290    |
| Fresh vegetables, total 4/                                | : Harvested | : 10.6                | : 11.3     | : 11     |
| (cabbage and onions)                                      |             |                       |            |          |
| Total cropland used for intertilled crops 5/              |             | : 3,232.7             | : 3,279.4  | : 3,292  |
| Oats  | : Planted   | : 2,620               | : 2,700    | : 2,750  |
| Barley  | : do.       | : 347                 | : 350      | : 300    |
| All wheat   | : do.       | : 69                  | : 70       | : 65     |
| Oats for grain  | : Harvested | : 2,573               |            |          |
| Barley for grain  | : do.       | : 347                 |            |          |
| Rye for grain   | : do.       | : 109                 | : 105      | : 100    |
| Flaxseed  | : Planted   | : 12                  | : 9        | : 10     |
| Hemp for fiber  | : do.       | : 31                  | : 42       | : 30     |
| Peas, dry field   | : do.       | : 8                   | : 9        | : 8      |
| Total cropland used for close-growing crops 5/            |             | : 3,196               | : 3,285    | : 3,263  |
| Hay, all tame except soybean, cowpea, and small grain hay | : Harvested | : 3,720               |            |          |
| Hay, all tame   | : do.       | : 3,876               | : 3,800    | : 3,850  |
| Seeds, hay and cover crop, all                            | : do.       | : 39                  |            |          |
| Summer fallow and failure                                 |             | : 253                 | : 153.6    | : 108    |
| Idle cropland   |             | : 170                 | : 170      |          |
| Total cropland 5/   |             | : 10,727              | : 10,727   | : 10,750 |
| Other plowable pasture                                    |             | : 2,357               | : 2,357    |          |
| Wild hay  | : Harvested | : 130                 | : 130      |          |
| Other land in farms                                       |             | : 10,249.3            | : 10,250   |          |
| Total land in farms                                       |             | : 23,464              | : 23,464   |          |

1/ By the Bureau of Agricultural Economics except as otherwise indicated

2/ Records of State War Board (where applicable).

3/ See "Suggested work outline of production adjustment phase of Area Programs" for assumptions with respect to 1945 estimate.

4/ Commercial crop.

5/ Total acres used for crops is less than the sum of the acreages of individual crops to the extent that two or more crops were, or will be, harvested from the same land during the year.

Estimates of crop yields per acre, 1945 with comparisons  
Wisconsin

| Crop                   | :             | :     | Yield per acre |          |
|------------------------|---------------|-------|----------------|----------|
|                        | :             | :     | Probable:      | Probable |
|                        | Acreage       | Unit  | on maximum:    | in       |
|                        | :             | :     | acreage 1/     | 1945 2/  |
| Column                 | 1             | 2     | 3              | 4        |
|                        |               |       | Units          | Units    |
| Corn, all              | : Planted :   | Bu. : | 43             | 43       |
| Soybeans for beans     | : Harvested : | do. : | 18             | 18       |
| Other domestic tobacco | : do. :       | Lb. : | 1,500          | 1,500    |
| Sugar beets            | : Planted :   | Ton : | 11             | 11       |
| Irish potatoes         | : do. :       | Bu. : | 100            | 100      |
| Beans, dry edible      | : do. :       | Lb. : | 560            | 560      |
| Peas, dry field        | : do. :       | do. : | 875            | 875      |
| Oats for grain         | : Harvested : | Bu. : | 43             | 43       |
| Barley for grain       | : do. :       | do. : | 35             | 35       |
| Winter wheat           | : Planted :   | do. : | 19             | 19       |
| Spring wheat           | : do. :       | do. : | 18             | 18       |
| Rye for grain          | : Harvested : | do. : | 14             | 14       |
| Flaxseed               | : Planted :   | do. : | 13             | 13       |
| Hemp fiber             | : do. :       | Lb. : | 1,075          | 1,075    |
| Buckwheat              | : do. :       | Bu. : | 16             | 16       |
| Hay, all tame          | : Harvested : | Ton : | 1.9            | 1.9      |
| Wild hay               | : do. :       | do. : | 1.1            | 1.1      |
|                        | :             | :     | :              | :        |

1/ Taken from 1943 State report on wartime production capacity (Form 2, Column 6).

2/ No significant differences in yield per acre are expected in 1945.



Estimates of production of livestock and livestock products,  
1945, with comparisons  
Wisconsin

| Item of livestock and<br>livestock products | : | Unit:   | Reported for<br>1943 1/2 | :                  | Estimated for<br>1944 | :           | 1945 | :          | 1946 |        |
|---|---|---------|--------------------------|--------------------|-----------------------|-------------|------|------------|------|--------|
| Column                                      | : | 1       | :                        | 2                  | :                     | 3           | :    | 4          | :    | 5      |
|   | : |         | :                        | 1,000              | :                     | 1,000       | :    | 1,000      | :    | 1,000  |
|   | : |         | :                        | units              | :                     | units       | :    | units      | :    | units  |
| On farms January 1:                         | : |         | :                        |                    | :                     |             | :    |            | :    |        |
| Horses, mules and colts                     | : | Number: | :                        | 474                | :                     | 460         | :    | 450        | :    | 445    |
| Cattle and calves, all                      | : | do.:    | :                        | 3,794              | :                     | 3,835       | :    | 3,800      | :    | 3,775  |
| Cows kept for milk, 2 years +               | : | do.:    | :                        | 2,452              | :                     | 2,525       | :    | 2,515      | :    | 2,500  |
| Other cows, 2 years +                       | : | do.:    | :                        | 23                 | :                     | 24          | :    | 24         | :    | 23     |
| Sheep and lambs, all                        | : | do.:    | :                        | 491                | :                     | 480         | :    | 475        | :    | 470    |
| Ewes, 1 year +                              | : | do.:    | :                        | 314                | :                     | 312         | :    | 310        | :    | 308    |
| Hens and pullets                            | : | do.:    | :                        | 18,471             | :                     | 18,750      | :    | 18,000     | :    | 17,500 |
|   | : |         | :                        |                    | :                     |             | :    |            | :    |        |
|   | : |         | :                        | Reported 1/2 or    | :                     | Estimated   | :    |            | :    |        |
|   | : |         | :                        | estimated for 1943 | :                     | for 1945    | :    |            | :    |        |
|   | : |         | :                        | 1,000 units        | :                     | 1,000 units | :    |            | :    |        |
| During year:                                | : |         | :                        |                    | :                     |             | :    |            | :    |        |
| Sows farrowed, spring 2/                    | : | do.:    | :                        | 431                | :                     |             | :    | 365        | :    |        |
| Sows farrowed, fall 3/                      | : | do.:    | :                        | 255                | :                     |             | :    | 205        | :    |        |
| Chickens raised 4/                          | : | do.:    | :                        | 29,483             | :                     |             | :    | 28,000     | :    |        |
| Commercial broiler production               | : | do.:    | :                        | -                  | :                     |             | :    | -          | :    |        |
| Turkeys raised                              | : | do.:    | :                        | 554                | :                     |             | :    | 550        | :    |        |
| Milk cows, average during the year          | : | do.:    | :                        | 2,389              | :                     |             | :    | 2,395      | :    |        |
| Milk produced                               | : | Pound:  | :                        | 14,240,000         | :                     |             | :    | 14,000,000 | :    |        |
| Eggs produced                               | : | Dozen:  | :                        | 175,000            | :                     |             | :    | 170,000    | :    |        |
| Cattle put on feed 5/                       | : | Number  | :                        | 67,000             | :                     |             | :    | 60,000     | :    |        |
| Sheep and lambs put on feed 5/              | : | do.:    | :                        | 84,000             | :                     |             | :    | 84,000     | :    |        |
| Average weight hogs sold or butchered 6/    | : | Pound:  | :                        | 235                | :                     |             | :    | 215        | :    |        |
|   | : |         | :                        |                    | :                     |             | :    |            | :    |        |

1/ By the Bureau of Agricultural Economics except as otherwise indicated.

2/ December 1 (of previous year) to June 1.

3/ June 1 to December 1.

4/ Excluding commercial broilers.

5/ Twelve-month period beginning on October 1.

6/ Weight in pounds instead of 1,000 pounds.



Estimated number of specified types of equipment that will be  
on farms in 1944 and additional number that would be needed  
for attainment of 1945 production, with comparisons  
Wisconsin

| Kind of equipment | On farms<br>for use<br>in 1943 | Expected<br>to be on<br>farms for<br>use in<br>1944 | Additional number<br>needed in 1945 |  |
|-------------------|--------------------------------|---|-------------------------------------|--|
|                   |                                |   | To replace<br>worn out<br>equipment | To increase<br>total of<br>equipment<br>in use |
| Column            | 1                              | 2   | 3                                   | 4  |
|                   | Number                         | Number  | Number                              | Number   |
| Tractors, total   | 97,600                         | 101,000   | 8,000                               | 5,000  |
| Wheel type        | 96,700                         | 100,130   | 7,500                               | 4,800  |
| Crawler type      | 900                            | 870   | 500                                 | 200  |
| 25 hp. or smaller | 675                            | 650   |                                     |  |
| 26 to 50 hp.      | 225                            | 220   | 500                                 | 200  |
| Trucks, total     | 53,400                         | 51,000  | 10,000                              | 3,000  |
| Jeeps             | xxx                            | xxx   | -                                   | 2,000  |



V. OPPORTUNITIES FOR SETTLEMENT ON LAND AFTER THE WAR  
(INCLUDING MILITARY LANDS)

A statement on "Veteran Readjustment in Agriculture" has been prepared by a special advisory committee for the Governor of Wisconsin as an aid in the drafting of new legislation dealing with aid to veterans who may wish to start farming after the war. This statement has been generally accepted as state policy. While the statement is directed primarily at the problems of soldier settlement, it is sufficiently comprehensive to indicate the general state situation and state policies regarding all post-war agricultural settlement and it is presented herewith as such.

A few observations concerning land settlement after the war, most of which are indicated in the committee statement, may be emphasized here and a statement on military lands is included.

1. From a national standpoint, the need and opportunity for additional settlement after the war may be very greatly reduced by the increasing efficiency of the farming industry. It has been indicated by both the State College of Agriculture and the U. S. Department of Agriculture that farmers could increase their output as much as 20 to 30 percent by using more fertilizer, improved varieties of crops and better livestock feeding, breeding and care. <sup>1/</sup> Present agricultural programs are designed to provide incentives to the further adoption of such practices. The farmers of this country are now producing a third more products with less labor than before the war and the probabilities are that, with more machinery available after the war, farm efficiency may be still further increased. In view of this trend, it is not at all certain that even a substantial increase in national food requirements after the war would justify an increase in number of farmers.
2. In view of the large number of farmers now on farms too small in size or on land not suited to farming, any post-war settlement program - at least if it attempts to go beyond aid to returning veterans - should include aid for the relocation of those on poor land and farm enlargement through farm consolidation or land development for the others. For those needing relocation, the purchase of their present submarginal farms will frequently be all that is needed to enable them to move to better farms or into industry. Aid and advice in securing or developing good settlement farms should, however, also be available. Aid in clearing or otherwise developing additional land for partially developed or small farms is more likely to be justified than the development of new farm units.
3. A most serious limitation to farm ownership by returning veterans or war workers, though not necessarily a limitation to farm

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<sup>1/</sup> 1943 State Production Capacity Study and U.S.D.A. radio broadcast, January 28, 1944.

operation, is the high level of land values that is likely to prevail after the war. If these are higher than can be justified by farm prices that are likely to prevail during a normal amortization period after the war, government loans for the purchase of farms would be a detriment to veterans rather than a benefit. There is also no justification for a program under which the government would buy farms at going market prices and resell to veterans at normal prices with the government absorbing the over-capitalization. It would be preferable to develop a program to aid veterans and others in securing satisfactory leasing arrangements on good rented farms and to aid them in financing the needed livestock and equipment for such farms.

#### A. Settlement Opportunities on Military Lands in Wisconsin

Since July 1, 1940, the War Department has acquired approximately 51,000 acres of land in Wisconsin for military purposes. In addition, title was transferred to the War Department for over 10,000 acres of land from the Soil Conservation Service and about 400 acres owned by the Indian Service. Considerable areas of this land will probably not be needed for military purposes by the government after the war. Several sites are in urban localities and will stay in industrial use. Air fields will probably continue in that use. The Indian Service will presumably have first chance at the land transferred from that agency. The only sites offering any possible opportunity for post-war settlement are Camp McCoy and the Badger Ordnance Works.

Camp McCoy is located in the West Central Wisconsin sand area. The land added to the camp by transfer from the Soil Conservation Service was acquired by that agency as part of the Submarginal Land Program. The 37,500 acres purchased by the War Department from private owners is about the same quality as that acquired by the Submarginal Land Program. Consequently, the Camp McCoy area offers no settlement possibility. Any lands in this area not needed by the War Department should be held in public ownership and withheld from settlement because of its low productivity.

The Badger Ordnance Works site northwest of Madison and just south of the Baraboo Range offers the only military land suitable for settlement after the war. The whole site includes about 10,500 acres. Of this, about 9,000 acres were good farm land before acquisition, 1,200 acres are Baraboo range land unsuited for agriculture, and the balance is non-farm land, largely recreational land along the Wisconsin River.

Approximately 86 farm units were acquired by the War Department, comprising about 9,000 acres of farm land (plus some Baraboo range land owned for a source of fuelwood and posts). The average size of farm acquired was about 105 acres. Twenty-three of the farms were 80's, thirteen 120's, and six 160's. Only six farms were over 165 acres (agricultural land). Most of the agricultural land was potential crop land, there being very little permanent pasture.



During the course of the ordnance plant construction, practically all farm buildings and fences were removed. Wells were obliterated. Considerable areas of top soil were removed and some new gravel roads constructed. These modifications will have damaged some of the land so that it will be totally unusable for agriculture while other areas, formerly crop land, can be used only for permanent pasture. This land use change will make larger farm units necessary in the post-war period. Preliminary estimates indicate about 8,500 acres will be suitable for agriculture after the war. If 160 acres are taken as a desirable average size for the post-war farms, about fifty units can be established.

The disposal of this land should be safeguarded to insure its acquisition by owner-operators, and in economic family sized units. Nearby owner-operators should have an opportunity to add some of the land to existing units where these units are now too small for efficient operation. Complex administrative arrangements to give former owners priority for purchase of their previous holdings do not appear justified. Such procedures could easily cause much trouble with the land titles, complicate replanning of farm boundaries, and add needlessly to the disposal job. A recent survey of the former owners revealed that only 9 out of 50 could be reasonably expected to have any desire to return to farming in the area.

## B. Veteran Readjustment in Agriculture

### Summary Conclusions

1. In the period of veteran demobilization, crucial problems of agricultural adjustment will be created.
  - a. Thousands of servicemen with farm backgrounds and experience will want to become established in farming.
  - b. Thousands of other persons will also be seeking farms at the same time.
  - c. Thousands of people who now possess improved or unimproved land will seek to dispose of it on a rising land market during the war and post-war years.
  - d. A nation-wide interest in land settlement is being fostered which may develop into interstate competition for new farmers and federal land reclamation funds.
  - e. Veterans returning to farming will have to compete for access to the high capital investments required in agriculture at a time when competition within agriculture will be unusually keen and when farm assets will be at peak prices.
  - f. It is not to the interest of the veterans or the state to encourage these men into agriculture unless the probable demand for farm products is such that they are reasonably certain to make an acceptable livelihood.

2. The most important source of post-war farming opportunities in Wisconsin will be found among existing developed farms.
  - a. It is estimated that about 33,000 developed Wisconsin farms will be available because their present operators will discontinue farming for financial or other reasons.
  - b. These available farms will be in areas and of the type with which rural Wisconsin servicemen are familiar.
  - c. Most of these farms will be available for purchase, but several thousand will be available on a lease basis.
  - d. If economic conditions in agriculture require that new farm units are needed, estimates based on the judgment of local people indicate that not over 5,000 new full-time farm units may be developed under conditions which offer some chance for success, but even these need to be carefully examined because development costs are high and the new farms will be in a relatively disadvantageous competitive position.
  - e. Any probable demands for new farms can be met without altering present policies of rural zoning and public forest land management.
3. For the stability of Wisconsin agriculture and as a service to Wisconsin veterans, the State should help qualified veterans to get established in farming under arrangements which allow a reasonable chance for success.
  - a. Whereas farming requires physical capability and whereas many veteran aids are dependent upon physical incapacity, maximum assistance to veterans who wish to return to agriculture may not be available unless the State has a program to help them.
  - b. The largest single factor determining the progress of a farmer often is the arrangement under which he first begins to acquire control of the necessary land and equipment.
  - c. There are sufficient existing sources of farm credit.
  - d. There still is need for the State to help veterans who return to developed farms to avoid overcapitalization of land values, excessive indebtedness, poor choice of farm, unsatisfactory leasing or financing terms, and unsuitable types of enterprises.
  - e. There is need for the State to guide veterans who may wish to establish new farm units to avoid the aforementioned dangers plus the extra hazards of new settlement, especially that of insufficient income during the developmental period.

4. Although the State of Wisconsin has provided the Veterans' Recognition Board with authority broad enough to include assistance to veterans who wish to reestablish themselves in agriculture, specific authority and additional funds should be provided to assist in the agricultural readjustment of honorably demobilized veterans.
  - a. The Veterans' Recognition Board should appoint an advisory Agricultural Policy Committee to recommend policy for the agricultural problems of veterans.
  - b. The Board should have additional funds with which to establish, in cooperation with existing state or federal agencies, an adequate advisory and guidance service to assist veterans with reference to agricultural opportunities. Such services would include:
    - (1) information on the availability of farms for sale or for rent.
    - (2) information on the availability of agricultural credit.
    - (3) appraisal guidance.
    - (4) evaluation of veterans' farming capabilities.
    - (5) guidance in financing or leasing arrangements.
    - (6) guidance in selection of farms, enterprises, equipment, and stock.
  - c. The board should not engage in making loans for the purchase of farm real estate or chattels, nor should it engage in land clearing, colonization, or development projects. It should make available, however, information relative to any such activities in the state or elsewhere and it should bring its policies to the attention of any who may engage or propose to engage in such activities in Wisconsin.
  - d. If the State appropriates funds for the vocational adjustment of veterans, the Board should have the authority to extend direct financial assistance to veterans who may qualify for such aid. The purpose of such assistance shall be to enable qualified veterans to complete their arrangements for reestablishing themselves in agriculture. Requirements for this type of assistance should be recommended by the Agricultural Policy Committee but should include:
    - (1) the inclination of the veteran.
    - (2) farm experience, physical capability and training for agriculture.
    - (3) the residence requirements of the State's veteran recognition program.
    - (4) the need for assistance, in relation to the veteran's full plan for establishment in farming.

- (5) feasibility of the terms of financing, land purchase, or leasing arrangements into which the veteran will enter with other public or private agencies or individuals.
- (6) the suitability of the farm unit in relation to the veteran's capabilities and plans for management.

### Backgrounds

Questions of post-war farm land opportunities are of sufficient importance that Wisconsin should begin at the earliest moment to determine its policies and to lay out its plans. The history of all post-war eras emphasizes that land settlement is bound to be an issue of considerable interest.

For thousands of our servicemen who were reared on farms readjustment to civilian life means reabsorption into agriculture. There are also many other people who are interested in finding a way to make agriculture a particularly attractive outlet for servicemen. Some feel that a larger farm population is a good thing in itself; others feel that agricultural production will need to expand in the post-war period; others want to feel the flush of accelerated business in their particular locality. Some perhaps want only an opportunity to sell off real estate holdings which normally would not find a good market.

All of these various forces may be found in varying degree in Wisconsin, and they will be given additional impetus by the pressure of these same forces. Already certain people in official positions have sounded the keynote for a national land development program which would concentrate particularly in the arid land states of the West. Canada has already enacted substantial legislation to assist in farm settlements. As other states or neighboring countries embark on land settlement programs, some will wish that Wisconsin enter the race to attract settlers.

In view of these forces and in view of the real complexity of laying out a sound policy and a workable program, it is time for us to look to these problems of land utilization and tenure in Wisconsin with particular reference to the problems of post-war readjustment for our servicemen.

#### 1. Past Experience

Fortunately the field of land settlement is not one which we need approach empty-handed; the history of publicly supported land occupation programs is too long not to have provided us with some lessons. From colonial times to the Civil War, grants of land in the public domain constituted a common form of reward for military service. About 6 percent of the land disposed of by the United States in the public domain was alienated through military warrants.

Conditions affecting the success of land developments and farm purchases have radically changed since the turn of the century and particularly since World War I. The tremendous effort of



developing our national agricultural plant was accomplished while the country was largely agricultural, the standard of living was far below present levels, and the national population was expanding by leaps and bounds. In addition, a high proportion of the land which was opened up proved to be extremely fertile and well adapted to crop production. Pioneers underwent hardship and deprivation, but they received some of their return in the form of the expectation that some day they would possess a full, productive, and valuable farm unit. And the fact is that the general level of land prices did constantly rise.

Since 1900 the situation has been markedly different; land available for settlement has not been readily adaptable to agriculture. Relative to existing farm land it has been in more remote areas, and has been more costly to clear and prepare for production. Since 1920, land values have not continued their historic upward trend. This condition has added further difficulty for those who would develop new farm units, and it has also accentuated the problem of buying existing farms as well.

We did not see these basic changes in the demand for new farm land clearly enough to avoid a number of disheartening experiences in land settlement after World War I. Several states and the federal government, together with numerous private enterprises, undertook programs of land colonization and individual settlement. In some cases, the programs were designed only for veterans but in other cases the programs were open to the general public, but with special preferences to ex-servicemen.

Between 1917 and 1923, thirteen states established policies to assist in the purchase, development and sale of land for farming purposes. In seven states, the policy was dependent upon federal participation in financing. Since this cooperation did not materialize, the legislation was inoperative. Wisconsin was one of these seven states.

The other six states (California, Washington, Oregon, South Dakota, Minnesota and Arizona) did make an attempt to prepare and sell newly made farms. It is a known fact that none of these state ventures accomplished the purpose sought. They were all handicapped from the first because costs were incurred during the high-price war and post-war years which were followed by declining farm prices and land values. But additional troubles were encountered which augmented the failure of these undertakings.

The State of California inaugurated projects at Durham and Delhi. These projects were carefully planned and they only included a total of 14,600 acres together, but they were sorry ventures. Although in 1923, it was believed by some that the state would be repaid the funds advanced with interest, by 1925 a special legislative committee recommended that California should never enter into another land settlement scheme. In 1928, the state liquidated its holdings and took losses of several millions of dollars.

The State of Washington tried unsuccessfully to colonize a 102 unit project but, after a few years, the state deeded the two-thirds of the units which were occupied to the settlers at \$1 each and auctioned off the one-third of the units which were still unoccupied. Oregon set up a demonstration program but never got beyond the establishment of only three farm units. In Arizona, about 1,000 acres of land were improved and sold to only 40 ex-soldiers; but in eight years the appropriation was exhausted and no money had been repaid to the state.

In Minnesota a state land improvement board began to prepare 24,000 acres of land for farm use. After 6 years, less than one-third of the improved tracts had been sold and many of the tracts which had been sold had reverted to the state in forfeiture. The state lost nearly all of the \$100,000 appropriated as a "revolving fund."

After World War I, the federal government confined its soldier settlement program to one of trying to rehabilitate veterans who had disability allowances. In Minnesota, the scheme was worked out on the basis of establishing new colonies of settlers. The veterans had the advantages of vocational training pay plus certain free tools and equipment. There is little doubt but that federal program was not a success, especially where the settlement was undertaken on a colony basis. In Minnesota, 75 percent of the settlers' units were abandoned within a decade.

After World War I there also was a widespread activity on the part of private land sales and colonization companies to develop new lands. For several years, such companies were active in the northern lake states. Studies made of the activities of these private agencies and the experience of the settlers indicate that in but few cases were the settlers able to improve their net worth position by participating in these land development schemes. The returns from agriculture simply were not sufficient to allow the settlers to meet the expenses of land development and farm construction. Some settlers turned to local outside employment to assist them in holding their places and in supporting their families. Others abandoned their units in favor of better income prospects elsewhere.

When, after 1929, alternative economic opportunities also became poor there was a tendency for people to settle in our new land areas. But the local costs of helping people to make such an adjustment to unemployment or farm foreclosure elsewhere proved to be so great that many Wisconsin counties undertook to protect themselves by rural zoning ordinances.

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#### Demand for Farms in Post-War Period

It is impossible to predict with accuracy the number of returning veterans who may want to become established on farms because statistics on inductions are not generally available. With a very rough estimate of the number of Wisconsin men in service and assuming that servicemen represent a cross-

section of the State, there probably will be at least 75,000 returning veterans who will have had some farm experience in their backgrounds. The number may be as high as 125,000. Not all of these men will put farming as their first civilian occupational preference, but the number who will do so may easily be over 50,000.

It is important to remember that Veterans will not be the only ones looking for farms after the war. Many thousands have left agriculture for non-farm work in war industries. Many of these people will look to agricultural opportunities because they have always planned on farming as their regular vocation and work in war plants is but part of their method of accumulating funds for a return to farming - others of them will look for farms if they feel that their jobs will be insecure during the reconversion period. Persons who are now farm tenants or laborers will swell the number who may seek farms after the war.

#### Farm Land Available in Wisconsin

##### 1. Existing Farms

The most immediate source of farming opportunities in the post-war period will be the existing farms of the state. Wisconsin has approximately 186,000 going farm units. Because one-third of these farms are now operated by farmers who are over 55 years of age, it is quite certain that there will soon have to be a change in the operatorship of 62,000 farms. In addition, a number of farmers who are now less than 55 years old will have to stop farming in the post-war years because they will have been working very hard with insufficient help.

About 57,000 of the farmers over 55 years old are owner-operators. Inasmuch as half of these owner-operators now have sons on the farm, there will be about 28,000 owner-operated farms in need of new operators. Some of these farms of course are "earmarked" for sons who are in the service; the rest will be available for other veterans who do not have a family farm to go to. Most of the 28,000 owner-operated farms which will be available after the war will be sold by the present owners. In some cases, however, the retiring owner-operators may offer the farms for rent rather than for sale because of the lack of alternative retirement investments and because of the incidence of taxes on capital gains.

About 5,000 of the farmers over 55 years old are tenants. New operators will be needed on these rented farms after the war. Owners of rented farms are in advanced age groups; it is therefore likely that a high proportion of the 40,000 rented farms in Wisconsin will be sold during the next ten years. While the sale of these farms will make it possible for veterans to bid for these places, nevertheless, the sale of a farm now rented by a young farmer will not create a new farm management opportunity.



In summary, in the post-war period 1/, some 50,000 Wisconsin farms will change ownership. Because some of these farms will be bought by present tenants or by new landlords, these farm transfers will create new opportunities for about 33,000 men, with 25,000 as beginning owner-operators and 8,000 as tenant operators.

## 2. New Land

For the northern and central counties of the State, estimates based on the work of County Land Use Planning Committees in certain counties indicate that an area of about one and a third million acres of land is not now in farms but may be potentially suitable for farm use.

During the past decade special efforts have been made by counties to dispose of small tracts of land (forties and eighties) to farmers for additional land for crop, pasture or woodlot purposes. As farmers and settlers complete the job of clearing their farms, additions to existing farms for these purposes will be in order. If the standard of development of 60 acres of crop land and 60 acres in unplowed pasture on each farm unit of 160 acres is established, a considerable part of the one and a third million acres will be absorbed by existing farms. It is to be expected that some of these additions will be land unsuited for intensive agricultural use but desirable because of location for pasture or woodlot purposes. County officials have frequently voiced the opinion that the most important job ahead in northern Wisconsin is the further development of the well located farms now in existence.

County Land Use Planning records also show that there are large areas now in farms which should eventually be retired from further agricultural use. (In 11 northern Wisconsin counties this amounted to 162,242 acres of land.) In addition there is one other large classification of land most of which is in farms but which is of questionable value for agricultural purposes. (In 11 northern Wisconsin counties this amounted to 475,556 acres of land.) Not all of the area classified as suitable for farming can conceivably be used for farming purposes. Some farms are already located in this area. Again, some of this area contains land which by reason of soil or topography could not be used for annual crop production.

If the undeveloped land were to be used for the development of new farm units of 160 acres each, there would be less than 5,000 new farms which could be recommended for consideration. Even this is a physical potential, and does not mean that even this number of farms could be recommended as economically feasible.

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1/ A period of about 15 years is here assumed by the Committee. If a shorter period is assumed, say 5 years, a smaller number of farms would be available. However, because of the rapid rate of retirement likely to occur immediately after the war, the number would be more than half of that indicated - perhaps two-thirds as much. (B.A.E.)



### 3. Rural Residences

In the post-war years there probably will be a continuation of the pre-war trend towards residential decentralization. Country homes, rural residences, garden homes and part-time farms for people employed in the cities may be expected to become increasingly important in Wisconsin as in other states.

It is important for us to remember that all such family units must be regarded primarily as residences and not as farms. They represent desirable developments in our rural economy only insofar as they have a non-farm income which keeps these families from being dependent upon income from agriculture. State policy should be based on a clear recognition of the dangers of putting a family in a position of dependence upon a farm unit which is insufficient for supporting a family. While there are possibilities that a family on a fully productive farm may gain some additional income from non-farm work and that a family fully employed in non-farm work may reap some gains from a small amount of home food production, experience shows that there is little chance for anything like a half-and-half arrangement.

For our returning veterans, therefore, any proposals for rural rehabilitation short of full-time farm units should be considered in terms of housing projects for veterans not dependent on farm income.

### Problems in Attaining Ownership of Existing Farm Units

There will be a chance that about 25,000 men who are not now on Wisconsin farms may be able to acquire ownership and to assume active management of farms in this state after the war. These farms are in developed areas with which veterans will be familiar. They represent the greatest source of post-war farm adjustment opportunities.

For the farms which will be generally available, veterans who desire to undertake owner-operatorship will have to bid against farmers, returning ex-war workers, and farm land investors. It is generally agreed that the dangers of an inflationary land boom are greatest in the immediate post-war years. After World War I, for example, Wisconsin land values continued to rise as they did before and during the war. The peak of farm land values in this state was reached in 1920. The war veteran, then, is likely to get a chance to buy a farm just at the time when the farm land market is at its height.

A thorough program of veterans' aid should include some provision to help the servicemen to overcome this greatest handicap to their successful re-adjustment to rural civilian life.

One possible suggestion is that the State undertake to option, or perhaps buy title, to farms which may be made available to it during the war years. If this were done it would be possible directly to help some veterans to find farms and to arrange for their purchase at reasonable prices.

This suggestion is not without its difficulties. There probably would be very many farms made available to the State on an option-to-buy basis because those anxious to sell would want immediate realization of the sale and those who only look forward to a future transaction would have no incentive to agree in advance on a price in a rising real estate market. A state optioning program, then, has little chance of accomplishment.

More farms could be arranged for under a purchase program but such an undertaking would involve a considerable amount of State investment per future veteran participant. In addition, the State would immediately be thrown into all the details of real estate management. At least two large problems would be involved. It would be necessary to work out leasing arrangements to assure the continued production of the farms during the war; this is not an easy thing to do. Secondly, a purchase program would involve the State in long-time financing arrangements with the veterans who finally got the farms. It does not appear feasible to recommend such a program. There is no lack of available agricultural credit; a state program of rural credits is not needed. If one were to be set up, it could be justified only on the basis of making easier credit terms. Terms now available from certain agencies appear to be so liberal that further liberalization can hardly be compatible with a sound program. State programs of cheap farm credit have universally proven very costly to the state and not very helpful to the farmers.

A wholly different type of approach may be suggested. The State might decide as a matter of basic policy not to become involved in a program of direct farm real estate financing, but rather to direct its efforts towards other forms of assisting veterans to get a reasonable chance at post-war farm opportunities. This policy could be effected through the provision of advisory and guidance services, buttressed by financial aids comparable to those made available to returning veterans who chose to follow other lines of civilian readjustment.

If the State is to make certain funds available to assist ex-servicemen to complete their education or to enter various businesses or occupations, then the State might make at least a comparable amount available to help other veterans establish themselves on farms.

Obviously, no State grants would ever be sufficient to enable full payment for a productive farm unit but grants up to a few hundred dollars might be enough to help measurably in making a down payment on a farm or to secure equipment or to get chattel loans from other agencies. If such grants were made available without restrictions, there would be a real possibility that the financial assistance would hurt the future security of the veterans more than it would help. It is therefore desirable that State agricultural grants should be made only as a part of a particular veteran's plan for becoming established on a farm. The State Board should make the aid available only when it is clear that such assistance is necessary to help a veteran get started on a sound program of farm entrepreneurship. Governing conditions should include:

1. Farming experience and physical capability of the veteran.
2. Productivity of the farm.
3. Reasonable appraisal of the farm's value.

4. The equity of the veteran in the farm enterprise.
5. Terms under which the veteran may get loans from other agencies.
6. The need for a grant to make the realization of the plans possible.

In other words, the State should only encourage veterans with some farm experience to undertake farming, and then it should see to it that the veteran start under reasonable circumstances. The State veteran's agency would make determination in each case before the grant was made to the veteran.

The important points in aiding the veteran are to assure that sales prices do not reflect a boom psychology; that the farm be suitable to the abilities of the veteran, and that the terms of financing provide for long term amortization at reasonable interest rates, and with flexible payment and prepayment privileges to the veteran.

The State's interest in rural rehabilitation for the veteran should not be restricted to a grant of funds made conditional upon his plans for starting to farm. The State should have an active guidance and advisory service to assist veterans in finding existing farms for sale or for rent, in actually helping them to gain access to the resources of reliable credit agencies, in assisting in the selection of farm enterprises, stock and equipment, and in the problems of farm management. Some of these services may be made available in part through existing agricultural agencies. But there should be tacit agreement that these services will be available on an individual basis if needed and that the veteran's interest will be promoted so far as possible by competent and sympathetic public agents.

#### Problems in Renting Existing Units

At least 5,000 farms, and perhaps two or three times as many, will be available for rent in the post-war period. However, much as we may dislike to think of a tenancy agriculture, the fact is that in some of the best areas of our state, as high as 50 percent of the farms have been rented in recent years. Under prevailing conditions, a beginning farmer may make as much financial progress and enjoy as high a standard of living as a tenant as he would as a heavily indebted owner. The real choice is not between ownership and tenancy but between indebted ownership and tenancy.

Veterans without large amounts of available cash for down-payment may, in many instances, prefer to use such cash funds as they may have for the purpose of equipping a good farm unit which may be leased. In such cases, the State policy may be applied with reference to aiding the veteran in his selection of the farm and the terms of the lease, as it helps him in a purchase transaction in the selection of the farm, its appraisal, and the terms of financing.

#### Problems in Establishing New Units

Assuming that the demand for farms is greater than can be filled by the purchase of already existing units, there may be reason for adding a few new units. It may also be assumed that a few veterans may prefer to go to new areas rather than remain in the established agricultural areas.

As far as converting raw land into farms is concerned, 25 years of experience has clearly demonstrated that most of the land in the state which is not



in farms now is not suitable for agriculture. State and county land policies have recognized this fact and have set up programs to devote this land to its most productive use, namely, forestry and recreation. In 25 counties of the northern and central parts of the state about 5 million acres are closed to agriculture by rural zoning. County, state, and federal forests have taken over other large acreages, which means that this area is definitely dedicated to forests and recreation.

It is therefore recommended that any new settlement should take place within the framework of the present land programs of Wisconsin and its counties. Land closed to agriculture by zoning, land dedicated to forest uses, areas designated for retirement and the land classed as questionable for farming should be excluded from the area open to settlement. Instead of taking land out of the restricted districts and opening it for agricultural settlement additional acres should really be added to the restricted areas of the zoned counties and should be restricted in the counties now without zoning ordinances.

Many counties have some raw land available for settlement even after the "potential" land which should be added to existing farms has been subtracted. It is recommended that careful examination be made of any specific tracts proposed to be settled, to include an examination of soils, topography, stoniness, presence of hard pan, need for drainage, frost pockets as well as climate in general, the cost of clearing and drainage, cost of getting suitable well water, and the relation of the tract to existing roads, schools, markets and communities.

There are many agencies which can be helpful in assisting the Veterans' Recognition Board to protect soldier settlers from the unfair practices of the unscrupulous, and see to it that the veteran is speedily furnished with community facilities and institutions. Thus a real guidance service should be set up for the prospective settler.

Part of the guidance service should warn the settler that settling on new ground is different than buying a going farming enterprise where he can expect an income from his land, capital and labor immediately. The chief inducement to buy raw land is that the land is cheap, but before raw land becomes a farm the settler will have paid the difference in the cost of clearing, waiting for an adequate income, a lower standard of living, meager buildings and dwelling, and inadequate community services.

It is suggested that salvaged war vehicles, explosives, road machinery, and other equipment be made available to help veterans improve land when there are reasonable prospects of success.

Where the Veterans' Board is petitioned for a grant to help a veteran who prefers to start on new land, it should keep in mind the conditions just described. Not only should the veteran be farm-minded, physically capable of farm work, but he and his family must be willing to live under pioneer conditions for a number of years. He must recognize that only gradually can he become a farmer.



A. Farm Land Tenure Goals <sup>2/</sup>

The principal goals of an ideal farm tenure system are adequate farm incomes, security for farm families in their expectations and equality of opportunities between farm and non-farm groups. These basic objectives are consistent with our national principles and with the social welfare. Yet underlying them are certain social responsibilities which place upon farmers the duty to maintain, conserve and develop the land resources entrusted to their care by society and to continue to produce ample food supplies at reasonable prices for the consumers.

In the ideal tenure system, farm families, regardless of their tenure status, should operate farm units of sufficient size and productive capacity as to allow them incomes that will support rural living standards comparable to those enjoyed by other major groups and which will represent equitable rewards for their productive efforts. Farm families should have freedom and flexibility in their farm operations; yet they should enjoy sufficient security in their occupancy and operations on farm land that they will be able to command dignity and respect as members of wholesome rural communities. Also their expectations of the future should be protected against the insecurity that rises out of the risks of serious price fluctuations, economic depressions, climatic hazards, ill health and old age. Finally, farm families should be able to enjoy opportunities for education, for active participation in community life, for the utilization of social and cultural facilities and for the development of personal skills and talents that will be comparable with the opportunities enjoyed by other groups in society.

B. The Farm Tenure Situation in Wisconsin

In 1900, only 13.5 percent of the 169,795 farms in Wisconsin were tenant operated while 81.1 percent were operated by full owners, 4.6 percent by part owners and .8 percent by managers. During the next 40 years the number of farm tenants in the state almost doubled and the census of 1940 found that 23.0 percent of the 186,735 Wisconsin farms were tenant operated while 67.8 percent were operated by full owners, 8.6 percent by part owners and .6 percent by salaried managers. The 1940 census indicated that 29.9 percent of the farm land of the state was under lease. Farm tenancy in Wisconsin is still largely a family affair. In 1930, 38.6 percent of Wisconsin's tenants were related to their landlords.

In 1940, the average full owner operated a 111.2 acre farm valued at \$5,981. On this farm he used equipment worth \$961 and he harvested 47.2 acres of cropland. The part owners had 166.3 acre farms, harvested

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<sup>1/</sup> This report has been prepared by the Milwaukee Regional Office of the Bureau of Agricultural Economics after consultation with Professors Wehrwein and Salter of the University of Wisconsin.

<sup>2/</sup> This section is based largely upon the section on "Farm Tenure Policy Objectives" in the report of the Corn Belt Land Tenure Committee.

70.2 acres, operated land and building investments averaging \$7,682 in value and equipment worth \$1246 while the tenants had 135.1 acre farms worth \$6,614 and harvested an average of 60.2 acres with equipment valued at \$1001. These statistics would seem to indicate that part owners and tenants in Wisconsin have more productive resources at their command than do the full owner-operators.

The statistics on mortgage indebtedness in Wisconsin indicate that the percentage of owner operated farms covered by mortgages increased from 51.1 percent of the farms in 1910 to 58.3 percent in 1940. Over the same period, the ratio of mortgage debt to the full value of the farm increased from 34.3 to 54.8 percent. For the state as a whole, operating farmers own approximately 45 percent of the value of Wisconsin's investment in farm land and buildings.

The farm tenure pattern in Wisconsin varies considerably in different sections of the state. In the southern and southwestern counties tenure conditions similar to those found in the Corn Belt are encountered. In this portion of the state almost all of the land is in farms and farm tenancy exists to a far greater extent than in the rest of the state. In the southern counties up to 51.3 percent of the farms (Lafayette County) were tenant operated in 1940 and operators' real estate equities ran as low as 25 percent in terms of county averages. In the northern cut-over counties quite a different situation exists. In some counties as little as 7.4 percent of the land (Vilas County) is in farms and only a small portion of the land in farms is actually cleared and cultivated. Most farm incomes are relatively low and the prevailing percentages of farm tenancy run far below the state average. In this area county averages for operators' equities run up to 50 and 60 percent. A still different situation prevails in a cluster of counties along the eastern lake shore. These counties have been settled long enough that most of their land is in farms (99.5 percent in Kewaunee County). Yet they boast very low rates of tenancy and Kewaunee County with 6.8 percent of its farms operated by tenants has the lowest percentage of tenancy in the state. Operators' equities in their farm land and buildings average between 40 and 50 percent in this area. In the counties that lie on the fringes of and between these three types of tenure areas conditions more comparable to the state statistical averages are to be found.

There are some indications that the percentage of farm tenancy in Wisconsin will continue to increase during the next few years. As some of the younger farming areas attain maturity and as more and more farmers retire or will their properties to non-farmers, the percentage of tenancy can be expected to rise. Other factors indicative of a future increase in the amount of tenant operatorship are also at work. Land market survey figures on the farms sold in four Wisconsin counties during 1943 show that 36 percent were purchased by owner-operators, 32 percent by non-farmers, and only 29 percent by tenants who were ascending the agricultural ladder. (Another 3 percent were purchased by unclassified farmers.) In most of these cases the buyer intends to operate the farm but 9.8 percent of the owner-operators and 55.5 of the non-farmers indicated that they had purchased the farm to lease it out. The tendency for non-farmers to invest in farms that will be

turned over to tenants for operation is most noticeable in southeastern Wisconsin near Milwaukee and Chicago.

### C. Critical Farm Tenure Problems

Several tenure problems exist or are developing now that will demand solution in the post-war period. Among the more important of these are the following:

#### 1. Land value inflation

Unless the buyer of a farm is able to pay most of his purchase price in cash as a down payment, he imperils his economic future when he buys land at prices in excess of the long time earning capacity of the farm. The greatest movement of land in the farm real estate market usually comes during periods of rising prices. Once prices start down again, the encumbered buyer of a farm purchased at inflated prices has little hope of paying his obligations except through good fortune, through the use of non-farm sources of income or through self, family, or resource exploitation. <sup>1/</sup> Those farmers who buy and pay for farms at inflated values take a loss if they sell when land values are down but they at least do not face the danger of foreclosure during their owner-operatorship.

The land market survey in Wisconsin indicates that the average sales price per acre of farm land increased from \$22 to \$30 between 1941 and 1943 in Barron County (an increase of 36 percent). In Jefferson County the increase was from \$62 to \$81 or a 31 percent increase while in Lafayette County the increase from \$41 to \$60 an acre constitutes a 46 percent increase in prices over the two year period.

#### 2. Unsatisfactory mortgage agreements.

Coupled with the problem of land value inflation is the tendency of farmers to forget the hard learned lessons of the past in resorting to the use of inadvisable sales and mortgage agreements. During 1943, 55.6 percent of the farm sales in the four land market survey counties in Wisconsin involved mortgages or purchase contracts. Of the mortgage lenders 55.9 percent were private individuals, 29.4 percent were commercial banks, 8.4 percent were Federal Land Bank loans, 3.2 percent were insurance companies and the balance of the loans were made by other parties. Throughout the north central region an alarming trend toward the use of short term mortgages (5 years or less in well over half of the sampled cases) is evidenced. Also a large number of mortgages are being written that provide for no amortization of payments. A rapid decline in farm prices after the war would place many of these farmer borrowers in a precarious economic position.

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<sup>1/</sup> Cf. B. D. Parrish, "How Long Will it Take an Operator to Pay for a Farm from Earnings?", Illinois Farm Economics, November 1943, pp. 16-20; and L. A. Salter, Jr. Land Tenure in Process, Univ. of Wisconsin, AES Res. Bull. 146, Feb. 1943, p. 74.



### 3. Increase in investment purchases of farms.

The tendency of non-farmers to buy farms as investments, as hedges against inflation, and for income tax deduction purposes has already been noted. Absentee ownership of farms need not necessarily be bad but frequently it results in undesirable tenure arrangements. The investor with a non-farm source of income is frequently in a position to disregard the income producing capacity of a farm in bidding its price up out of the reach of the would-be owner-operator. In this respect non-farmers can be held partially responsible for inflated land values.

Not all of the non-farmer purchases result in tenant operation. In many cases, particularly in the rural-urban fringe communities, small farms are being purchased for rural residence purposes and for the security of the investors in case of unemployment in the future. These situations give rise to problems of the part-time farmer and of rural-urban fringe areas.

### 4. Difficulties in achieving farm ownership.

Technological advances have made it possible for one man to cultivate larger and larger acreages of land and these developments together with rising price levels have made larger capital investments necessary. The necessity for acquiring considerable capital before attaining ownership of a farm going concern and the effect of farm enlargement programs in reducing the number of available farms on the market has made it increasingly difficult for wage hands or tenants to ascend the agricultural ladder.

### 5. Post-war competition for farms.

After the war many men returning from the armed forces or from war industries will want to start farming. The competition caused by this back-to-the-farm flow of people can lead to some bidding up of rental rates and to some depressing of farm wages. A farming system, such as that in Wisconsin, that has been able to produce record breaking crops in spite of a labor shortage during the last few years does not offer the employment opportunities on farms that will care for a very large back-to-the-farm movement.

The chief source of farms that will become available after the war in the older sections of the state are those now operated by older men. Many farmers retired at the close of the last war and a similar trend is to be expected after World War II. In 1940 the number of full owners on farms who were 65 years old or more was over 50 percent greater than in 1910. Still it is estimated that after the war only about 33,000 developed farms will become available for persons not now on those farms. Many service men and war workers would have been "in line for a farm" had there been no war. Many of these men will be able to go back to their home farms but others may find it difficult to find a suitable place for themselves in agriculture.



6. Post-war settlement problems.

Since opportunities for the acquisition of many already developed farms will be lacking in Wisconsin, some farmers will probably attempt to hew farms for themselves from out of the agricultural fringe and cut-over areas of the state. Attempts along these lines should be carefully watched and every effort needs to be taken to prevent settlement in sub-marginal areas that can support only sub-standard living conditions. (Cf. Section V.)

7. Soil conservation.

America's basic resource, the soil, is not being properly safeguarded under existing tenure conditions. The primary responsibility for conserving and developing the soil should rest upon the landlord. Insofar as both the landlord and the tenant neglect their responsibilities along this line, it may be necessary for society to step in and secure the best interests of the public in gaining conservation. The present strain upon the productive capacity of Wisconsin farms is discouraging rather than promoting conservation practices. Special cognizance should be given to this problem after the war and farm operators should save money and make plans now for post-war conservation work. (Cf. Section II)

8. Landlord-tenant relationships.

Farm tenancy is accepted as a part of the American land tenure pattern. But the aim should always be toward good tenancy. Landlords and tenants should work together cordially and cooperatively in the best interests of both. While custom and competitive factors regulate the bargaining position of both the landlord and the tenant, they should always remember that they are dividing a bundle of responsibilities, duties and rights in the use of the land. They should also remember that society is the third party to their every arrangement.

Proper landlord-tenant relationships call for a division of the farm income in proportion to the responsibilities assumed and the services performed by each party to the contract. Tenancy is not good when it leads to the impoverishment of either the tenant or of the soil.

9. Many other problems which have a bearing upon the conditions of land tenure will be encountered after the war. Among these are problems such as: inadequate and obsolete farm equipment and improvements, need for better rural housing and improved rural living standards, the problem of bringing social security to agriculture, rural health facilities, maintenance of channels through which rural youth can migrate to other fields of opportunity in industry, and the problem of maintaining prices that will make the establishment of good tenure conditions possible. Several of these problems are being treated in other sections of the Wisconsin report.

#### D. Possible Lines of Action

Nearly every tenure problem suggests possible lines of action that merit consideration. These solutions should be evaluated in terms of their ability to achieve the overall goals of tenure policy.

It will take far more than tenure policy to bring about adequate incomes for farm families. Policies relative to adequate sized farm units, good farm markets, stabilization of farm prices, control of business cycle fluctuations and maintenance of full employment by industry necessarily affect the income that will accrue to agriculture. However, tenure policies and land tenure status have influences on the distribution of income within agriculture. To achieve adequate incomes for farm families, the following lines of action are suggested:

1. Farm rental terms that will lead to a fair distribution of the farm income between the landlord and his tenant should be developed and publicized.
2. Consideration needs to be given to the development and publicizing of information relative to adequate wage rates for farm laborers.
3. Both owners and tenants need farm units of adequate size if they are to put their abilities and capital resources to best use. Flexible tenure relationships that will enable farm operators to adjust their farm enterprises to their labor supply and that will bring a satisfactory income to the farm family without leading to exploitation of the farm plant should be encouraged.

At the present time these programs should be accepted as being educational only. However, legal assistance might be granted to those individuals who need an interpretation of their rights and duties or who must resort to legal action to secure their rights.

The goal of security for farm families in their expectations calls for several suggested lines of action. Here again, the problem of attaining security does not lie entirely within the field of tenure. Instability in farm price structures, the demands of industry and of consumers for farm goods, climatic hazards, fire, plant and livestock diseases, and individual mishaps and uncertainties such as ill health and old age are largely responsible for the insecurity felt by farm families. Within the field of land tenure, however, the following steps can be taken:

- a. Insofar as possible, farm land prices should be held down to levels justified by the long time earning capacity of the farm capitalized over a period not exceeding 20 years. More stable farm prices would give the soundest basis for preventing wide fluctuations in land values. A progressive tax on speculative farm sales might be used as a possible means of checking inflation but this control of farm resales is not sufficient to really keep land prices down. More stringent controls such as the use of transfer permits and limitations

upon the use of credit could have more effect in preventing the inflation of land values. Farm loan agencies should strictly adhere to a policy of placing conservative valuations on farms and efforts should be taken to acquaint land buyers with the normal appraisal values of the farms that they purchase. Plans have already been made in Wisconsin to offer service men expert advice relative to farm appraisals and the financing of their farm purchases.

- b. Minimum standards in farm mortgages and sales contracts should be emphasized and legislative action in this regard may be desirable. Provisions should be made for reasonably low interest rates, long-term amortization and variable and prepayment privileges. In some cases, particularly where the buyer has but a small equity in the farm, provisions for possible supervision should be made.
  - c. If no steps are taken to control the land boom or to place the writing of farm mortgages on a sounder basis, provisions should be anticipated for foreclosure laws, debt adjustments, and mortgage moratoria that can be used in the future to cushion the impact of declining prices upon the debt commitments of encumbered farm owners.
4. A government-sponsored program to help young men gain the capital necessary to assume ownership and to operate farms as full going concerns is needed. This program might involve an expansion of a modified tenant purchase program with emphasis on supervision and selection of borrowers. However, a program permitting the use of insured credit might be accepted with greater favor. The advantages of this program should first be made available to men returning from the armed forces. Later the program should be made available to all prospective farmers.
  5. The attainment of security for farm families dictates that education and guidance be used in settlement programs after the war. Areas zoned out of agriculture should remain out of agriculture unless the need for their use can be demonstrated. A program for retiring sub-marginal lands and buying out non-conforming users in zoned areas should be speeded up.
  6. Considerable waste is involved in the transfer of farms from one generation to the next. An educational program should be sponsored that will stress the importance of more farmers using wills, the desirability of early settlement of unsettled estates, and the advisability of making arrangements whereby the farm unit will be passed on as a full going concern. Older farmers should consider a number of different arrangements such as bonds of maintenance, life estate interests, father and son partnerships or co-tenancy, etc., when they make their plans for transferring the operation of their farms to younger operators.
  7. Security cannot be enjoyed by tenants unless their leasing agreements provide for adequate notice or automatic renewals with compensation

for disturbance. The duties of the landlord in maintaining the soil should also be emphasized. Legislative action that will more clearly define the rights and duties of Wisconsin landlords and their tenants should be encouraged.

8. Consideration needs to be given to means for protecting families against the risks of price changes and climatic hazards. Programs should be developed that will give farmers security in ill health and old age.

If the farm families of Wisconsin could achieve farm incomes that will support high rural standards of living and if they could gain security in their expectations they would come close to having equality of opportunities with other groups in society. Indeed, in most respects the realization of these aims would place the farmers in an enviable position when they are compared with other groups. But other programs can be suggested that will improve upon the opportunities farm people have for cultural, educational and social development. Programs for improvements in rural housing, for the extension of power lines into more rural areas, for the improvement of the health of rural people, for rural school improvements and for extending the educational, social and cultural programs of rural communities to migrant tenant families who do not readily acquire a sense of belonging in the community can help to achieve this tenure goal.

Before the farmers of Wisconsin can really be said to enjoy cultural and social advantages comparable to those of the non-farm groups, something must be done to extend to farm people the ability to enjoy vacations and off-farm leisure. A program calling for two houses and two families on the larger farms might permit farmers to enjoy more leisure and also allow some division and specialization of labor in the farm work. However, the effects of such a program upon farm management, upon farm tenure conditions and upon land inheritance should be studied before any final recommendations for two family farms are made.



## VIII. SOCIAL SECURITY FOR FARM PEOPLE IN WISCONSIN

The Citizens Committee on Public Welfare in its report to the Governor of Wisconsin in 1937 defined "Social Security" as the aids and services given or extended by the federal, state, or local governments to an individual or family, provided such aids or services are administered in the form of work relief, "special aids", or direct relief. There is also included medical aid given to the individual either in his home or in hospitals at public expense. Because the child is a part of the family, child welfare services are included as a part of the social security program. It also recognized the inclusion under "Social Security" of the activities that are under the Federal Social Security Act.

The State Department of Public Welfare, established in the Laws of 1939, grew out of the recommendations of this committee. Under it the Social Security Aid programs are: - old age assistance, aid to the blind and aid to dependent children. The Wisconsin Public Welfare Review, 2nd quarter, 1940 answered the question "Who are the recipients of old age assistance?" In Wisconsin there were at the time some 235,000 persons above the age of 65 years of whom 51,420 were in receipt of old age assistance in June 1940. In a study published by the Federal Social Security Board an estimate was made that only about 35 per cent of the aged population is financially independent, that 45 per cent are supported by relatives and 20 per cent are dependent upon the public for support. Available information would indicate that much the same situation obtains in Wisconsin as for the country as a whole. It has been general experience that urban centers as compared with rural areas have a disproportionately larger number of persons receiving public assistance. It is interesting to see that this is not the case with old age assistance recipients in Wisconsin. Tables indicate that approximately the same proportion of individuals accepted (1940) were from urban and rural sections as there were persons over 65.

In three Wisconsin rural counties, without cities of over 2,500, (Buffalo, Burnett, Iowa) in January, 1940 there were respectively 284, 481 and 454 (total 1,219) recipients of old age assistance, averaging about \$20.00 per the month. In the three counties the 1940 census lists 4,538 population 65 years of age or older, a little more than a quarter of whom received old age assistance.

### Old Age And Survivors' Insurance

How the activities under the Federal Social Security Act, which the Citizens Committee did not discuss in its report of 1937, are working out are indicated in a report summarized in the Milwaukee Journal, January 23, 1944.

"Of all the New Deal reforms, none, perhaps, promises such a permanent effect upon American life as the Social Security Act. Passed in 1935 and amended in 1939, the social security law offers protection and peace of mind to hundreds of thousands of American workers. It is supported by a pay roll tax paid into the treasury. Appropriations, now equaling the tax collections, are made by congress to support

social security. Eventually social security with its federal old age and survivors' insurance may almost eliminate the word "relief" from the vocabulary of the family of the average American worker. The law, of course, must be broadened before this becomes a reality, but beneficial effects of the law are already being felt in many Milwaukee homes.

"According to the latest estimates by K. A. Albrecht, manager of the Milwaukee office of the social security administration, more than 7,000 persons in the Milwaukee area now receive some \$150,000 monthly in old age and survivors' insurance benefit payments. The Milwaukee area includes Milwaukee, Washington, Ozaukee and Waukesha counties.

"The benefits are being paid to retired workers, their wives and children, to widows and to aged parents. In addition to the monthly benefit payments, the social security office here has paid out thousands of dollars in lump sum death claims in cases where the workers were not survived by persons eligible for monthly payments. The social security law as it stands today sets up an entirely new insurance system, providing substantial payments to widows and children or dependent parents of the pay roll tax payers after their death. When the insurance feature was added to the original annuity provisions of the law, critics asserted that the law was no longer actuarially sound. The financial soundness of the plan will be determined only at the time when a much larger segment of the American people depend wholly or in part for their support upon their monthly benefit checks. The plan is still young and the real tests are perhaps still to be met. But it has already offered a sense of security to the average worker which he never possessed before."

#### Social Security For Farmers

That farmers are interested in being included in the insurance features, as well as the public assistance features, of Social Security is indicated by the action of the National Grange at its last annual meeting as reported in the National Grange Monthly, January, 1944.

"The question of Social Security for farmers was discussed at some length at Grand Rapids, and the prevailing sentiment appeared to be that its benefits should be further extended to cover farmers and farm labor. However, the resolution finally passed recommended that the subject be referred back to the states for special study during the coming year. Several State Granges have already gone on record in favor of extending Social Security benefits to all groups, including farmers, and it is likely that the next session of the National Grange will take definite action."

Dr. Carl C. Taylor has summarized the major reasons why farmers are not included in the insurance features: (1) They have not demanded that they be included, and (2) the machinery for administering a social security program among the self-employed had not been completely worked out at the time the social security law was passed. Neither of these is an insuperable difficulty. Whether farmers desire to be included they themselves must decide. They will probably be included if and when they express a widespread desire to be included. The Social Security Board has already worked out alternative schemes for

administering social security programs as it applies to the self-employed. Discussion of these alternatives with farm groups would result in the selection of that alternative plan which would best suit self-employed farmers.

### Postwar Social Security Proposals

In the American Economic Review, December, 1943, Prof. Edwin E. Witte (on leave from the University of Wisconsin) discusses the "Wagner" Bill now before congress in which are provisions whereby self-employed persons, including farmers, may voluntarily come into the social insurance system by paying contributions of 7% of the market value of their services. Some of the provisions of the bill and its prospects to which Prof. Witte calls attention are: - "Old age and survivors' insurance is to be extended to practically all employed persons with the only important exceptions, federal employees who are included in other retirement systems, and state and local employees, who may, however, be brought within the system by the voluntary action of the state and local governments. The system is, hereafter, to provide benefits for permanent disability, along with the present old age and survivors' insurance benefits. The latter benefits are liberalized by increasing the minimum benefit from \$10 per month to \$20 and also raising the maximum. Eligibility for benefits is made slightly less restrictive and the benefit formula is liberalized by a new rule for computing average earnings. The retirement age for women and age of eligibility for wives' allowance is reduced from 65 to 60.

"The health insurance system proposed differs from that of other countries in that medical care benefits are sharply distinguished in administration from the cash benefits for temporary and permanent disability, which are combined, respectively, with unemployment insurance and old age insurance, while the medical care benefits will be entirely independent of all cash benefits. The medical care to be provided is to cover not only the insured workers but also their wives and children and is to include general medical and specialist services and hospitalization benefits, with dental and nursing services as possible additions later on. These services are to be rendered by physicians and hospitals contracting with the government, with free choice of physicians by patients. The bill further provides for grants in aid for medical education, research, and the prevention of disease and disability."

The chief medical officer of the Farm Security Administration notes that, "Unlike previous measures, the federal insurance program for medical care set up in this Bill is inclusive of the agricultural population. The problem of how periodic collections are to be made from the farm population is not settled, but it is to be noted that for the self-employed group, under which category the average American farmer would come, the contribution is set at 7% of incomes up to \$3,000. A wage earner, on the other hand, contributes 6% of his income with an additional 6% of his income being furnished by his employer. Numerous questions are, of course, unsettled with regard to the contributions which can be expected from tenant farmers, sharecroppers, farm laborers, and other such groups."

Prof. Witte calls attention to the further fact that "The states would be left in the social security picture only in workmen's compensation,



which is not dealt with in the bill, and in relation to the several forms of public assistance, which remain under state and local administration, but with the national government furnishing the larger part of the funds and having broad powers to set standards. The reserves in the state unemployment insurance funds would not be "stolen" by the national government, as was proposed in some earlier plans for the federalization of unemployment insurance, but would continue to be available only for the payment of unemployment insurance benefits."

When the bill was introduced, Senator Wagner stated that he did not claim this bill to be in any sense a perfect instrument, but that it was offered simply as a basis for legislative study and consideration. Prof. Witte thinks that "While no one expects the bill to be passed soon, it is (1943) very much alive and apparently getting increased attention. More important in appraising the prospects for a comprehensive revision of our social security legislation in the near future than the strength of opposition groups is the present attitude of the American people. The tide is still flowing strongly toward conservatism in everything domestic. There is little interest in social security while the war continues."

However he thinks that "The longer time prospects are very much brighter. To begin with, social security has immense popularity in this country. The Gallup poll recently indicated that even health insurance has majority support. There is every reason to believe that the interest in social security will grow apace as the end of the war approaches. The imminent end of the war will bring much fear of wholesale unemployment in consequence of demobilization and the cessation of war industry. It will be particularly the war workers who will have reason to worry, and their great numbers insure that the politicians will have to give heed to their interests. Extension and liberalization of unemployment insurance will then have a much stronger appeal than now, as will federal aid for general relief. So will more liberal old age pensions and disability insurance, when the oldsters and the not-so-fit face the prospect of losing their present jobs. If, when the war ends, these fears actually materialize, the demand that the government do something will be irresistible. And, despite all the present fears and suspicions of Washington and the bureaucrats, should a really serious situation develop, it is a safe prediction that it will be the national government that everybody will look to to do something. Unless action is timely, however, that something will be the same sort of an emergency relief program as we resorted to in the great depression, rather than an orderly, planned social security system such as is proposed in the N.R.P.B. report and the Wagner Bill."

Prepared by the regional staff of the Division of Farm Population and Rural Welfare, with the co-operation of the Department of Rural Sociology of the University of Wisconsin, February 1944.



## IX. SOME DESIRABLE POSTWAR HEALTH PROGRAMS FOR RURAL WISCONSIN

### Summary

Recognizing the desirability of maintaining a healthy rural population in Wisconsin, the following courses of action seem feasible and practical for rural areas of the state: (1) insure an adequate supply of physicians; (2) insure adequate hospital facilities; (3) insure adequate dental facilities; (4) develop plans for equalizing and spreading the burden of the cost of medical and health care; (5) place primary responsibility for administering the socio-economic phases of medical-health programs in hands of local people; (6) expand health education programs, particularly those dealing with nutrition, sanitation, preventive health and accident control; (7) stimulate local interest in health problems and programs; and (8) develop a research program to study the non-medical aspects of health problems.

### A. Some Practical and Feasible Postwar Health Programs

The maintenance of a healthy population is of prime importance. Illness and disability cause: (1) considerable loss of time; (2) great impairment of efficiency where actual disability does not occur; and (3) a large expenditure of money. The problem involved in creating and maintaining a healthy population is exceedingly complex and covers many phases. The following proposals deal with some pertinent aspects of the general health problem in the rural areas of Wisconsin which may be regarded as particularly pressing and amenable at least to partial solution during the postwar period.

#### 1. Insure an adequate supply of physicians for the rural population.

To maintain a healthy rural population in Wisconsin an adequate supply of physicians available to service rural areas should be insured. To do this several of the more rural sections of the state will probably need a larger number of practicing physicians.

Generally speaking, physicians tend to concentrate in the larger cities, particularly medical centers. According to the American Medical Directory of 1940, which was used to determine the medical service pattern of the state before the drain of physicians into the armed services, there were approximately 3500 active physicians serving the civilian population of Wisconsin. About two-fifths of these were located in Madison and Milwaukee. This was one physician for 889 population. In strictly rural places there were 1906 persons for each doctor. It may be logically assumed that farm and rural populations are more likely to be serviced by physicians located in places having less than 10,000 population than by practitioners with offices in places 10,000 or over. For places having less than 10,000 people the ratio of population per physician was 1412:1. For places with 10,000 or more people the ratio was 609:1. Upon this basis there is wide variation among the counties of Wisconsin in availability of physician service for farm and rural people.

In addition to number of physicians, location of physicians' offices, density of population, number of large towns or cities, and type of roads greatly affect the medical services actually available to the farm residents of an area. The age of physicians also needs to be considered in this connection. Many older physicians are physically unable to carry a large practice. Hence the effectiveness of the medical care available in the rural areas of Wisconsin is dependent to a degree upon the extent to which these areas are served by older physicians. If physicians returning from military service tend to concentrate in the larger urban centers to a greater degree than they did before the war, the rural medical situation will be further aggravated. Unless some efforts are made to counteract it, present indications are that this concentration will be the general trend rather than the exception.

Considering all these factors, generally speaking, the counties of the state having 1500 or more persons per physician will need a larger number of physicians to insure adequate medical care for the rural population of those areas.

## 2. Insure adequate hospital facilities for the rural population.

General hospital facilities should be adequate to provide for the essential hospital needs of the rural population. This will: (1) provide the necessary facilities to enable the physician serving rural areas to practice medicine as he has been trained to do and as he is expected to practice by his patients; (2) provide necessary facilities for the effective treatment of disease and disability; and (3) do much to insure an adequate supply of physicians for the rural population.

In 1943 there were 129 registered general hospitals in Wisconsin available to the civilian population. These hospitals had approximately 11,350 beds. Sixty-nine of these hospitals with 2,270 beds were located in places having less than 10,000 population. Only eight counties did not have a general hospital. Although these general hospitals are fairly well distributed over Wisconsin, the ratio of population to number of beds is quite large in many places and the facilities somewhat inadequate from this point of view. Little information is at hand as to the conditions of admission for rural residents in general hospitals of the state.

## 3. Insure adequate dental facilities for the rural population.

Adequate dental facilities should be made available to the rural population of Wisconsin. The United States Census for 1940 reports 2,087 male dentists in Wisconsin. Of these, more than three-fourths were located in urban areas, and more than one-fifth in the city of Milwaukee. As with physicians, dentists in the larger cities of 10,000 or more population are not patronized to any great degree by farm and rural residents. Likewise dentists returning from military service are likely to concentrate in the larger urban centers unless some inducement to do otherwise is given them. The development of dental clinics, connected with hospitals or medical clinics where feasible, will do much to insure adequate dental facilities for the rural population of the state.

4. Develop plans for equalizing and spreading the burden of the cost of medical and health care.

To carry medical and health service successfully to the rural population two fundamental problems will need to be solved: (1) the cost of medical service will have to be spread so that the burden will not be concentrated upon a few people at a given time; (2) a means must be found for giving financial assistance to those for whom the costs of medical service go beyond ability to pay. The cost of physicians, hospitals, nurses, dentists, and other health items under the present system of medical and health practice is paid each year by a small group who are ill or disabled. Upon this group, probably already experiencing a reduced income and increased operating expenses, is thrown the burden of paying costs out of proportion to the average individual's income. Although the farm people of Wisconsin are for the most desirous of paying their own medical and health bills, the cost of these services is frequently beyond the resources of large numbers of those living in the country, and for many others it means a hardship and depletion of resources to meet the larger medical and health bills.

Several plans, such as the Blue Cross hospitalization plan and the Farm Security Administration medical care plan for FSA clients, are already operating in many rural areas of the nation to equalize and spread the burden of the cost of medical and health care. These plans and others should be examined critically to determine the feasibility of extending the principles embodied in these plans to the rural areas of Wisconsin.

5. Place primary responsibility for administering the socio-economic phases of medical-health programs in hands of local people.

Local areas should have the primary responsibility in administering any plan or plans to equalize or spread the burden of the cost of medical and health care. State and national participation should be in the form of loans or subsidies under a minimum of supervision, or in the form of supplementary demonstration work. Participation of families or individuals in any plan of this type should always be voluntary.

Most health problems and situations of a socio-economic nature are local in character, although the same types of situations may exist elsewhere. Only by vesting as much control as possible of measures to meet these needs in the hands of local people, both professional and lay, can these problems and situations be speedily and effectively handled.

6. Expand health education programs for rural areas.

The scope and coverage of all health education programs, particularly those dealing with nutrition, sanitation, preventive health measures, and control of farm and home accidents should be greatly extended among the rural population of Wisconsin. The effective use of all medical and health facilities by farm people is dependent to a very large extent upon the degree to which the people concerned understand their health needs and problems. Health education programs can do much to develop this understanding.



- a. Nutrition - The relation of diet to health is well established, yet for one reason or another this relationship is not too well understood in rural areas. It is most desirable that increasing efforts be made to develop, expand, and implement those programs which are designed to show the farm and rural people of the state the effect of diet upon health. Particular attention should be given to the presentation of nutritional information in terms that the average rural resident can understand, and in turn, use.

Public agencies active in promoting nutrition among the rural people of Wisconsin are: (1) the Agricultural Extension Service; (2) the public schools; (3) the Wisconsin State Board of Health; and (4) the Farm Security Administration. All these agencies should be expected to expand their programs of nutrition education wherever and whenever feasible and practical.

- b. Sanitation - As with nutrition, sanitation has a direct relationship to the health of the rural people. Yet knowledge of sanitary practices and procedures in the rural areas is not as extensive as is to be desired. Often where this knowledge does exist, it has not been translated into action. Hence, not only is factual information needed, but positive attitudes toward actual use of this information should be encouraged and developed. Special attention should be given to: (1) the relation of proper food handling practices to control of many diseases such as diarrhea and undulant fever; and (2) the effect of sewage disposal and drainage upon the family water supply.

- c. Preventive health measures - The average person or group values, appraises, and uses medical and health care largely in the "curative" aspect. Much less attention is given to and much less use is made of the so-called "preventive" aspect. Assuming that "keeping well" is just as important as "getting well", if not more so, greater stress needs to be put upon the development and expansion of preventive health programs in the rural areas. Preventive health measures are frequently little known, less understood, and even less observed by rural people. As a result, prevention of disease, as well as the curing of disease, frequently takes the form of extensive use of patent medicines and home remedies.

There are at least two practical approaches to the development of a wider preventive health program in the rural areas of Wisconsin. First, greater interest and more favorable attitude toward preventive health problems and procedures need to be developed by physicians serving rural areas. Many rural physicians are not much concerned with preventive health problems and tend too often to pass their unconcern on to the rural people. Second, the public health program needs to be intensified and expanded. At the present time the rural areas of Wisconsin are served by nine district public health units and three county units. An increase in the number of county public health units would mean greater opportunity for presenting preventive health programs to the rural population of Wisconsin.



- d. Accidents - Accidents on the farm and in the home cause considerable disability and consequent loss of time among the farm people of Wisconsin. Too frequently disability of greater severity and length than necessary follows the failure of proper and immediate care of a physical impairment resulting from an accident. Needed to correct this situation are: (1) an adequate and effective educational program designed to identify and correct accident hazards on the farm and in the farm home; and (2) an educational program to show the value of proper and immediate treatment of injuries resulting from accidents. Particularly, the work of the Wisconsin Agricultural Extension Service in Farm Safety education should be commended and expanded.

7. Stimulate local interest in health problems and programs.

Local interest in local health problems and programs and their relation to the health problems and programs of the state and nation should be stimulated. Local community groups having both lay and professional membership are needed to discuss and plan for action to solve the health problems of the area. Some of these problems will be strictly medical and of concern only to the local medical profession. Others will be largely medical in nature but of vital interest to both the medical and lay population of the community. The economic aspects of the health situation will concern both professional and lay groups as will also the educational aspects. In each phase, leadership in stimulating discussion and action should be placed in the hands of those most qualified, capable, and interested in working out a successful solution to the problem or problems involved. Successful solution of the various health problems will depend in large measure upon the degree of local interest and action that is developed and sustained.

Of first importance, then, is an enlightened leadership which will show the way in stimulating these local groups. Existing agencies might well consider the feasibility of employing professional workers to provide this leadership.

8. Develop a research program to study the non-medical aspects of rural health problems.

Rural people are becoming increasingly aware of their health problems and health needs. In this, Wisconsin is no exception. Guidance of this interest into effective channels of planning and action is most desirable. The stimulation of local interest and action through local community groups will do much to guide this growing awareness into effective channels.

To assist local groups in satisfactorily dealing with their health problems, considerable research in the certain socio-medical and socio-economic aspects of these problems is necessary to provide factual information for the local groups. If the health problems of rural areas are to be solved, careful study of the following phases of these problems are essential: (1) extent of morbidity among the rural population of the state; (2) cost of illness and disability; (3) use of medical and other health facilities in the treatment of illness and disability; (4) availability of medical and other health facilities to the rural

population; (5) the attitudes of professional personnel toward the rural areas they service and the attitudes of rural areas toward the professional personnel servicing them; and (6) effective methods and procedures for presenting health information and programs to rural people in a manner that they will understand in in turn use.

Prepared by the regional staff of the Division of Farm Population and Rural Welfare, with the cooperation of the Department of Rural Sociology of the University of Wisconsin, February 1944.

## X. POST WAR RURAL HOUSING

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The status of rural housing in Wisconsin, as shown by the 1940 census, indicates the need for many new buildings and extensive repair and remodeling of existing buildings. It has been estimated that from 5,000 to 6,000 new houses will be needed in the post war period.

According to the CWA survey in 1934, 69.1% of the farm houses in Wisconsin are 25 years old or older; 29.5% are over 50 years old. The 1940 census figures show that 30.8% of houses need major repair, 81% do not have running water in the house, 85.4% have outside toilet or privy, 49% do not have electric lights. While these figures show some slight improvement over the CWA Farm Housing Survey of 1934, which indicated that 84.2% did not have water piped in the house, 86.6% had outside toilet or privy, and 61.9% did not have electricity, the improvement has been relatively slow.

That there is close relationship between income and housing improvements is shown by a study conducted in 1941 in three Wisconsin counties<sup>1</sup> in which information was furnished by 323 families. More than two-fifths of the statements on the effects of low income were concerned with some aspect of housing. These families indicated that housing improvement was the outstanding item among those mentioned as having been crowded out because of low income, and would receive attention if income should increase. Nearly two-thirds of the comments indicated intention of repairing, remodeling or modernizing the old house in some way or of replacing it with a new one.

During 1941 the gross income for Wisconsin farmers rose about 40% above that of 1940. In 1942 another study, made in Iowa County, Wisconsin<sup>2</sup> definitely pointed out the influence of increased income on housing improvements. 309 or 61.1% of the 506 families contacted had made some improvement in housing by remodeling, modernizing, or repairing, or by adding new equipment or furniture. A study now being carried on at the University of Wisconsin, contrasting family expenditures for 1940 and 1942 of 135 FSA families indicates in a tentative preliminary report that 2.2 times as much was spent for housing improvement in 1942 as in 1940.

Another fact indicated in the Iowa County study was that farm families themselves provide a considerable amount of the labor needed for repair and some of that needed for remodeling, as well as supplying some of the materials from their own farm.

These studies, together with experience of persons working in the field of rural housing, indicate that families themselves recognize the need for repair, remodeling and new structures, and when income is available, they are inclined to make such improvements. They also indicate that they tend to do a portion of the work themselves, using both purchased and native

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<sup>1</sup>/ Study conducted by May L. Cowles and Ina Head.

<sup>2</sup>/ "Expenditures for Farm Housing Improvement in a Southern Wisconsin County," May L. Cowles and Mildred M. Siek, Journal of Home Economics, Vol. 35, No. 9, November, 1943.



materials. Housing improvements must compete with many other items in the farm and farm family list of needs and desires.

Recognizing the effect of housing on the health, efficiency, stability and happiness of the farm family, it is important that certain definite steps be taken at once to prepare for the post war rural housing activity. Among the problems to be faced in the post war housing activity are those having to do with guidance of farm families, rural leaders, rural builders and other interested persons; research; availability of materials, etc. Much of the war time farm savings will go into modernizing farm homes and remodeling farm buildings.

New farm homes deserve architectural planning that make them convenient and efficient. They should not merely be adaptations of urban house plans in a farm setting. Barns and service buildings should not necessarily follow traditional design but should be the product of careful search for greater utility, economy of labor and efficiency.

### Financing

Among the important essentials in the matter of financing are: (1) the focusing of every effort toward the maintaining of a high level of farm production and income among farm families; (2) the accumulation now of excess income in savings or bonds to be used in building improvements as soon as post war conditions are favorable; and (3) the consideration of a credit program which will make long time loans available for rural housing at a satisfactory rate of interest.

### Educational Programs

In addition to having funds available, there is real need for a co-operative and widespread educational program concerning various phases of rural housing activity. The College of Agriculture should take the initiative in launching immediately such a program. The cooperation of other interested agencies and groups at national, state and local levels, such as Vocational Education, Farm Security Administration, Farm Credit Administration, rural schools, rural builders, material dealers, rural community leaders, etc., should be enlisted to assist in the development of and the carrying out of such a program. Interest and activity on the local level is especially important in implementing such a program.

Such a program should emphasize such phases of the housing activity as planning, special training in building processes or skills, technical aid, research, etc.

1. Families who have funds and plan to improve housing conditions should be encouraged to analyze their needs and to determine the specific housing repair or modernization items in which they should first invest their funds and energies, being certain that they do not purchase the thing less needed and that will less well serve their purpose.



2. Long time plans, including an analysis of the present farmstead and the planning of the future farmstead layout should be encouraged on all farms, looking forward to an attractive, comfortable house with running water, central heat, adequate insulation, having efficient room arrangement and especially efficient kitchen and laundry arrangements, with efficiently planned barn and other service buildings, properly located with attention paid especially to sanitation, fire protection, and with attractively landscaped grounds.
3. A series of different type house plans, taking into consideration different income groups, using different types of materials, etc., should be developed and made available to farm families, rural leaders, builders and material dealers, etc., throughout the state.
4. Popularized graphic instructional materials, demonstrations, short courses, etc., should be made available throughout the state to assist families and others in understanding of planning and construction items. Construction helps are especially needed for those families where income limitations make it necessary for them to do much of their own work and to use native materials.

To provide such special training, information, technical aid, basic plans and needed research will necessitate the addition of personnel to the college and extension staffs. Special schooling or short courses for returning service men with skills in electrical wiring, plumbing, or carpentry should be given consideration. This is a matter for immediate consideration of those persons in authority in the colleges.

#### Research

Research in the matter of materials, construction methods, plans with special attention to arrangement of kitchens, etc., is needed and a definite program should be launched. Such a program may be cooperative between states, colleges and agencies.

#### Availability of Materials

Families having native materials on their own farms should be encouraged to prepare such materials now so that they will be ready for use when needed.

Action should be taken at once to work out with the Federal Housing Authority plans for making available scrapped war housing materials and equipment for rural housing in areas contingent to present housing projects.

This preliminary statement was prepared by members of the Midwest Committee on Post War Programs. Acknowledgment is given Professor Max LaRock and Professor May Cowles, University of Wisconsin, College of Agriculture, for helpful suggestions and ideas.



## XI. RURAL ELECTRIFICATION

Throughout the world, postwar agriculture will be an electro-agriculture. This is indicated by the fact that there are already a number of countries in Europe and Asia where nearly 100 per cent of the farms are electrified, and by the further fact that already several hundred applications of electricity have been developed for productive farm use.

With modern methods of construction many public spirited citizens feel that with the national postwar programs to insure full employment at wage levels commensurate with American living standards, there are no reasons why every farm and rural community of this great country should not have electric power with all its conveniences. As a matter of fact the wide availability of electric power in rural areas will be basic to the achievement of full employment. Because of its necessity to modern technology, widespread rural electrification and the availability of electricity at low rates will go far towards supporting plans for full employment and a high national income.

While here in America rural electrification is now only 40% complete, it will no doubt increase rapidly immediately after the war. At present, about 57.1% of Wisconsin farms have central station electric service. However, this represents a tremendous advance in the short period of 8 years since 1935 when only 19.6% of Wisconsin farms enjoyed that advantage.

Electricity on the farm is no longer a luxury, but has become a necessity for efficient farm production and management, and for better farm living. It saves time and labor and money. Its effective use is reflected through increased production of better quality products for home use and for commercial markets, thus increasing the real income of the farmer. The rapid extension of rural electrification after the war will provide work during the transition period from a wartime to a peacetime economy for hundreds of thousands of men who will no longer be needed in the armed services or in war production. Rural electrification will be an important factor in helping the many discharged soldiers returning to farms to have modern farm production facilities essential to good living standards. It also makes possible the modernizing of rural community facilities and services for better health, better education, better recreation, and the development of new rural industries.

Our colleges and vocational schools having the teachers and facilities could train service men who will be returning to rural communities, to do carpenter work, electrical wiring and plumbing necessary to modernize farm homes. This will help alleviate the excessive costs which have always been the chief obstacle to such a modernization program.

Specifically in Wisconsin, postwar expansion of rural electrification will be of paramount importance to the welfare of the large rural population and therefore of the state. It will help the State of Wisconsin to maintain its rightful place in our national economy.

It is the purpose of this section of the Wisconsin state report to describe the present status of rural electrification in the state and to indicate the place and the scope of rural electrification in the immediate and long-range postwar periods so that the following objectives may be attained for the state as a whole:



1. Extension of central station electric service at low-cost non-discriminatory rates to all rural communities and farms as soon as materials and manpower become available;
2. Optimum application of electricity to farm production and farm family living.
3. Optimum use of electricity in rural communities for economic, cultural, and social advancement;
4. Use of electric power for development of rural industries wherever feasible, to provide greater employment opportunities and more cash income for people in the rural areas of the state.

#### A. Present Situation

##### 1. Status of rural electrification on farms, rural non-farms and rural establishments.

|   |         |    |
|---|---------|----|
| Total number farms . . . . .                | 186,735 | 1/ |
| Total farms with electric service . . . . . | 106,700 | 2/ |
| Percent of farms electrified . . . . .      | 57%     | 2/ |

|   |         |    |
|---|---------|----|
| Total rural farm dwelling units . . . . .                       | 215,084 | 1/ |
| Total rural farm dwelling units with electric service . . . . . | 104,858 | 1/ |
| Percent rural farm dwellings with electric service . . . . .    | 51%     | 1/ |

|   |         |    |
|---|---------|----|
| Total rural non-farm dwelling units . . . . .                         | 205,549 | 1/ |
| Total rural non-farm dwelling units with electric service . . . . .   | 172,028 | 1/ |
| Percent rural non-farm dwelling units with electric service . . . . . | 85%     | 1/ |

Total rural farm and non-farm dwelling units without electric service . . . . . 141,292 1/ 3/  
 (a total of 13378 additional consumers have been served by REA-financed systems since the 1940 census)

Total miles of REA-financed lines in state of Wisconsin . . . . . 14,320  
 (as of October 31, 1943)

Total consumers served by REA-financed systems in Wisconsin . . . . . 33,872  
 (as of October 31, 1943)

1/ 1940 Census

2/ REA - 1943 report

3/ Difference in total due to those not reporting in census.



2. The percentage of electrical equipment ownership on REA financed systems in the North Central area of the U.S. having an average service experience of 20 months, as reported in a survey made in 1941 is as follows:

| <u>Equipment</u>             | <u>Percent Owning</u> |
|------------------------------|-----------------------|
| Iron                         | 89.0                  |
| Radio                        | 90.9                  |
| Washing Machine              | 79.1                  |
| Refrigerator                 | 43.1                  |
| Toaster                      | 44.4                  |
| Hot Plate                    | 19.6                  |
| Vacuum cleaner (floor)       | 28.0                  |
| Motor up to 1 HP             | 28.7                  |
| Coffee Maker                 | 7.8                   |
| Water systems and pump jacks | 24.0                  |
| Cream separator              | 19.0                  |
| Poultry lighting             | 18.9                  |
| Range                        | 5.4                   |
| Brooder                      | 10.3                  |
| Milking machine              | 5.9                   |
| Electric fence               | 4.3                   |
| Motor 1 HP and over          | 3.5                   |

As this survey reveals, newly connected REA members, who are often unacquainted with the uses and value of electricity, are keeping up the pace of more experienced consumers in the use of electrical equipment.

While these figures indicate that the greatest expenditure is made for labor-saving equipment in the home, the State averages show that in specialized farming areas appropriate production farm equipment is being used on about one-fourth of the electrified farms.

With greater emphasis placed on production farm equipment such as, water systems, milking machines, milk coolers, dairy sterilizers, poultry lighting and brooders etc., and with the availability of long term financing and group purchase of electrical equipment, a marked increase will undoubtedly result in the use of production farm equipment.

3. Status of Plumbing and Water Systems

The 1940 census shows the status of plumbing and water systems to be as follows:

| <u>Rural Farm Dwelling Units:</u> | <u>Percent</u> |
|-----------------------------------|----------------|
| With running water . . . . .      | 19.0           |
| With flush toilet . . . . .       | 11.6           |
| With bathtub or shower . . . . .  | 11.8           |

A modern water and sewage disposal system is probably the greatest single benefit electricity can bring to a farm home.

A modern bathroom not only provides comfort and convenience but helps in guarding the health of the farm family.

A modern pressure system provides water for fire protection and increases farm income by providing plenty of drinking water for livestock and poultry at all hours and at temperatures most efficient for the production of milk, meat and eggs. A ready supply of water for sanitary purposes helps insure better quality food products and health of livestock. A pressure irrigation system will assure the farm family of an ample supply of garden vegetables in addition to providing sufficient water for certain crops in times of drought.

#### B. and C. Estimate of Immediate and Long-Range Rural Electrification Needs and Costs.

The attached table on the following page covers the estimate of the man-hours and dollar cost of electrifying a total of 96,640 rural establishments which might be served under present standards of feasibility.

These totals are as follows:

|                       | <u>Man-hours</u> | <u>Cost</u>  |
|-----------------------|------------------|--------------|
| Line Construction     | 6,164,900        | \$28,718,000 |
| Farmstead Wiring      | 4,016,800        | 16,950,000   |
| Farm & Home Equipment |                  | 19,727,500   |
| Plumbing              | 4,871,000        | 8,255,000    |
| Totals                | 15,052,700       | \$73,650,500 |

It is estimated that approximately 24,160 unserved rural establishments in Wisconsin can be served only under broadened standards of feasibility. These establishments represent approximately 20 percent of the unserved establishments of the state.

| Periods | Line         | Potential: | Farmstead | Farm & Home: | Totals   |
|---------|--------------|------------|-----------|--------------|----------|
| :       | :            | :          | :         | :            | :        |
| :       | Construction | Consumers: | Wiring    | Equipment    | Plumbing |

|                     |                     |                     |                     |                    |                     |
|---------------------|---------------------|---------------------|---------------------|--------------------|---------------------|
| Totals              | Cost - \$28,718,000 | Cost - \$16,950,000 | Cost - \$19,727,500 | Cost - \$8,255,000 | Cost - \$73,650,500 |
| :Man Hrs. 6,164,900 |                     | MH-4,016,800        |                     | MH-4,871,000       | Man Hrs. 15,052,700 |

THE ESTIMATES GIVEN IN THE REPORT ON THE PRECEDING PAGE WERE  
BASED ON THE FOLLOWING FIGURES

1. FIRST PERIOD - BETWEEN NOW AND END OF THE WAR

LINE CONSTRUCTION (including organization work, contingencies,  
engineering and legal)

Miles and Consumers - Estimated on the basis of twice the  
number of U-l-c connections to date

|                                     |        |
|-------------------------------------|--------|
| Average cost per mile of line       | \$1192 |
| Man-hours of labor per mile of line | 267    |

FARMSTEAD WIRING

|                           |       |
|---------------------------|-------|
| Average cost per consumer | \$130 |
| Man-hours per farmstead   | 34    |

FARM AND HOME EQUIPMENT EXPENDITURES

|  |      |
|--|------|
| Expenditure per consumer<br>(includes farm equipment only) | \$85 |
|--|------|

PLUMBING EXPENDITURES

No expenditures considered in this period - water  
systems were included in farm equipment purchased

2. SECOND PERIOD - TRANSITION

LINE CONSTRUCTION (included organization work, contin-  
gencies, engineering and legal)

Miles and Consumers - Based on total allotments  
under stop order and applications on file

|                               |       |
|-------------------------------|-------|
| Average cost per mile of line | \$825 |
| Man-hours per mile of lines   | 200   |

Potentials along existing lines - Based on  
assumption that 50% of potentials will be  
connected

|                                       |       |
|---------------------------------------|-------|
| Average cost of connecting potentials | \$150 |
| Man-hours for connecting potentials   | 27    |

FARMSTEAD WIRING

|                           |       |
|---------------------------|-------|
| Average cost per consumer | \$175 |
| Man-hours per farmstead   | 38    |

An expenditure of \$50 and 5 man-hours of  
labor for each U-l-c connection are included  
to take care of additional wiring

FARM AND HOME EQUIPMENT EXPENDITURES

Based on the assumption that:



|     |   |       |
|-----|---|-------|
| 50% | new consumers each will spend approximately | \$200 |
| 10% | ditto                                       | 300   |
| 40% | ditto                                       | 75    |

and that:

|     |  |      |
|-----|--|------|
| 50% | of present consumers each will spend approximately | \$80 |
| 10% | ditto  | 250  |
| 40% | ditto  | 40   |

(Source, REA survey of 1941, with saturation percentages increased enough to take care of wartime savings, group purchases, etc.)

### PLUMBING EXPENDITURES

Based on assumption that:

|     |  |       |
|-----|--|-------|
| 35% | of new and present consumers will install water system and sink at average cost of | \$128 |
| 22% | of new and present consumers will install complete bath at average cost of         | 78    |

(Source, REA survey of 1941, with saturation percentages increased enough to take care of wartime savings, group purchases, etc.)

Man-hours of labor:

|  |                              |     |
|--|------------------------------|-----|
|  | For installing pump and sink | 26  |
|  | ditto complete bath          | 140 |

### 3. THIRD PERIOD - LONG-TIME POSTWAR PROGRAM

#### ESTIMATE OF CONSUMERS TO BE SERVED:

The total of 83,210 consumers which it is estimated will be served during this period represents those unserved establishments given in the 1940 census after subtracting the following:

- Total consumers connected to REA lines since 1940 census.
- Total consumers connected in first and second postwar periods.
- Total unserved consumers living within sparsely settled areas which can be served only under broadened standards of feasibility.

|                               |       |
|-------------------------------|-------|
| Average cost per mile of line | \$800 |
| Man-hours per mile of line    | 170   |

#### FARMSTEAD WIRING

|                           |       |
|---------------------------|-------|
| Average cost per consumer | \$175 |
| Man-hours per farmstead   | 38    |

## FARM AND HOME EQUIPMENT EXPENDITURES

Based on same estimates as given in the transition period.

## PLUMBING EXPENDITURES

Based on same expenditures as given in the transition period.

### D. Potential Benefits of Area Coverage Rural Electrification

Achievement of the potential benefits of rural electrification is dependent primarily on the application of the principle of area coverage and the accompanying resultant lower construction costs. This principal has been recognized by leaders in rural electrification as of extreme importance. Using that principle, electric service may be brought on an economic basis to substantially every farm within an area. That principle permits mass production methods to be followed so that construction and distribution costs may be absorbed by both large and small consumers.

From the foregoing statistical summaries related to line construction and requirements for farm equipment and household appliances the direct benefits of a program of rural electrification may be measured in a relative manner by total costs. Direct labor only enters into these costs estimates. The ratio of direct to indirect labor in a program of rural electrification is approximately four to one, based on experience of the Rural Electrification Administration. This experience also indicates that farmers and other consumers during the first year after energization purchase wiring, plumbing and other electrical equipment in an amount nearly equal to the cost of the lines. Thus, on this basis, the total overall program proposed herein would result in a total expenditure of nearly \$74,000,000.

Specifically for the estimate of the approximately six million man-hours work involved in direct labor for construction of lines, it is estimated that about 24 million man-hours of work would be required for the indirect labor. Indirect labor would include work involved in mining, processing, transporting and manufacturing of poles, conductors, transformers, line and generating equipment, and the processing and the manufacturing of the tremendous volume of electrical household and farm equipment that would be purchased by consumers after the facilities were constructed. For that part of the program for which estimates are presented above, it is estimated that some 15 million man-hours of labor would be required.

As indicated in the foregoing part of this report, the rural electrification proposed herein will go far toward supporting plans for full employment and high national income. Thus, tangible evidence is seen in the above with respect to direct measurable benefits, even though they may be only potential and contingent upon a program of area coverage rural electrification. So long as rural electrification programs are carried out on the present self-liquidating basis, the

measurement of benefits against costs is not a problem and as a consequence no subsidization or grants-in-aid have been considered.

The National Resources Planning Board has recognized the intangible and general public benefits coming from rural electrification under a program of areal coverage of REA. Its report states, "The most widespread of the intangible public benefits of rural electrification is its general contribution to the social and physical well-being of rural America . . . . The effects of electric power on health are substantial because it makes possible modern plumbing, refrigeration, running water, the bathtub and the inside toilet - all of which are important contributions to sanitation . . . . Electric lights in home and school will help to save eyes of many rural childred."

The value to this program will also be reflected in the contribution to general farm economy and the "real farm income by making possible increased production for home use and for the commercial market. The applications of electric power to productive farm operations have just begun."

The creation of new rural industries and the possibilities of some industrial decentralization are intangible but general public values considered by the National Resources Planning Board. "The possibilities of industrial decentralization which rural electrification holds out is also considered by many people as an economic and social benefit of great potential significance . . . . availability of electric power in rural areas certainly tends to remove an obstacle to the greater dispersion of industrial activity . . . . Experience to date indicates that there has been a substantial increase in the number of industrial and commercial consumers of power on REA-financed systems."

"Still another general benefit", continues the report, "which rural electrification shares with many other programs, is its stimulus to employment and economic activity in periods of depression. It will be remembered that the REA program was inaugurated in 1935 with funds from an emergency relief appropriation before being placed on a different legislative and financial basis in the following year. In considering this aspect of rural electrification, it is important to consider that a very high proportion of the employment is off-site employment in the manufacture and transportation of materials. Only about 20 percent is direct employment in line building. Thus a given amount spent on rural electrification will provide considerably more employment in industry than in the rural areas where the lines are built."

The question may arise as to the extent of expanding or contracting a selfliquidating program of rural electrification according to general economic conditions. Farmers who want electric service may feel that so long as they are paying for the service, which they feel is basically essential to modern farm production and farm living, they should be able to secure rural electrification when they want it. Again, the above report has brought together the combined views of all interested groups and individuals on this matter in recognition that the program must be tempered by the needs of the economy as a whole and "that extreme variations in the magnitude of such a program from year to year are not desirable. When general public benefits are substantially equal, perhaps the greatest use of that 'accordion Principle' in public works activity should be reserved for programs in which the direct government contribution is high."

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